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# Minnesota Retrofit Insulation In Situ Test Program

**June 1978** 

Prepared For

U.S. Department of Energy
Assistant Secretary for Conservation
and Solar Applications
Division of Buildings and Community Systems

Under Contract No. EY-76-C-02-2843



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June 1978

The Minnesota Energy Agency
With the Assistance Dynatech R/D Company and John Weidt Associates, Inc., Zaradiana Allina de La Contraction de

For

## U.S. Department of Energy

Assistant Secretary for Conservation and Solar Applications Division of Buildings and Community Systems Washington, DC 20545

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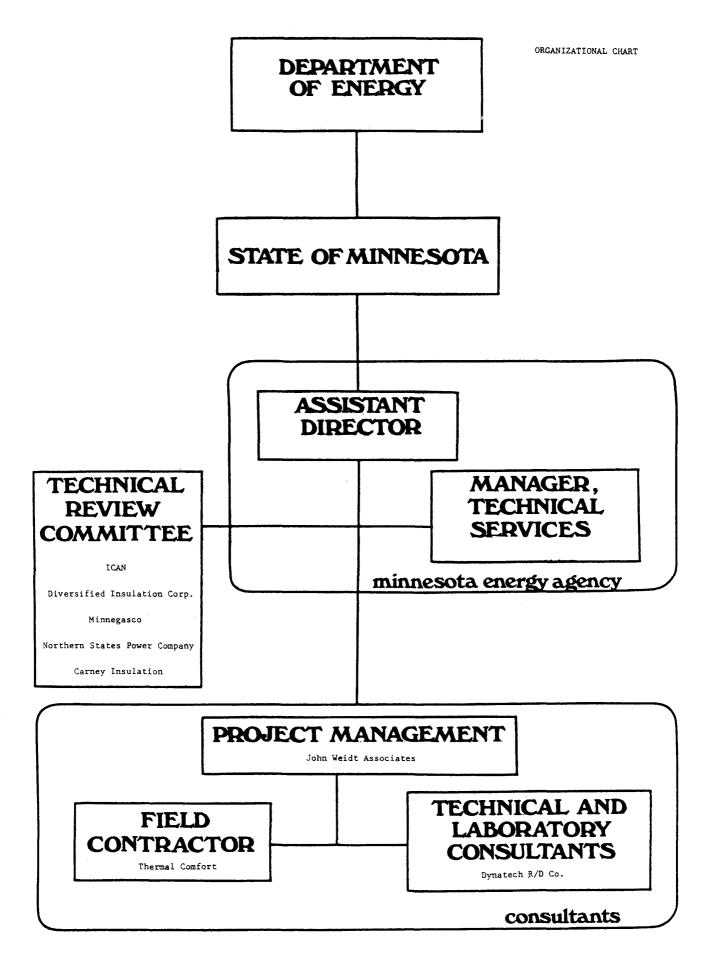
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#### 2. INTRODUCTION

It is estimated that there are well over 20 million uninsulated or poorly insulated residential dwellings in the United States. A substantial energy savings can be realized by insulating the walls and ceilings of a significant number of these homes.

Little is known of the performances of insulation materials once installed in walls and ceilings. Insulation is largely unseen, but its insulating properties must remain in effect. Additionally, it must remain compatible with the structural materials and not create conditions deleterious to the integrity of the dwelling or to the health of the occupant. Because substantial energy savings depend upon the quality of these largely unseen insulations, because the health and safety of dwelling occupants may depend upon these materials, and because millions of dollars will be spent by homeowners on these products, their situ properties of various thermal insulations must be known. This report details the findings of a study of these materials as they exist in the dwelling.

The program consisted of a set of field observations of the insulation and the dwelling and laboratory measurements of properties critical to the insulation's performance. The samples were selected from the Minneapolis and St. Paul, Minnesota metropolitan areas and were obtained during the summer of 1977. Because of the small sample size, the results herein do not possess statistical validity and must be used judiciously. The application of this report should be for planning the course of future programs designed to study insulation in situ.

#### 3. SUMMARY REPORT

#### 3.1 PROJECT DESCRIPTION

#### 3.1.1 Organization

The project studied cellulose, glass fiber, rock/slag fiber and urea formal-dehyde installed as retrofit insulation materials in residential walls and ceilings. Local homeowners were requested to volunteer their residences for field testing. Homes were selected for testing according to the type of retrofit insulation, age of retrofit insulation and whether the retrofit was in the wall or ceiling. The total project was comprised of 22 wall and 48 ceiling samples.

#### 3.1.2 Field Work

Samples of retrofit insulation were taken from an area of three to four square feet in the ceiling or wall of the home. Ceiling samples were obtained either directly from open ceilings or by removal of attic floor boards. Wall samples were obtained by removal of the exterior siding of the residence or by cutting open a portion of the interior wall. The sample volume was measured, the sample removed and double-sealed in polyethylene bags, the area inspected, new insulation installed and the area repaired to the satisfaction of the homeowner. Photographs of each phase of the work were made and a work sheet with pertinent information and a sketch of the condition was prepared. The samples were shipped to the laboratory for testing, accompanied by the photographs and worksheets.

#### 3.1.3 Laboratory Work

The test samples were received at the Dynatech Measurements Laboratory and the density determined from the sample weight and from field volume measurements. The moisture content, thermal resistance and relative flammability of each sample was determined. Additionally, the friability and compressive strength of each urea-formaldehyde foam sample was measured.

#### 3.2 FINDINGS AND CONCLUSIONS

#### 3.2.1 Cellulose

Several of the suggested problems with cellulosic loose fill insulation are settling, loss of thermal resistance, moisture build-up within the cellulose causing cellulose deterioration and structural damage, flammability, loss of fire retardancy, fungal growth and corrosion. Project results indicate that settling and moisture build-up are not serious problems. One-third of the samples tested were more flammable than our Class II labelled control and one-fifth could be ignited with a match in air. Age did not affect the properties of the cellulosic loose fill; in fact, the two oldest samples of 11 and 18 years had properties slightly better than the average. No fungal growth was evident. Corrosion was not a studied property.

#### 3.2.2 Urea-Formaldehyde

The notable suggested problems with urea-formaldehyde foam are shrinkage and property degradation with time. Shrinkage occurred with every sample measured, ranging from 2.5 to 9%, averaging 4.5%. This shrinkage did not correlate with any other studied property or with time. Degradation of the foam samples with time did not occur. Density was the most critical property affecting the other properties. The higher the density, the higher the thermal resistence per inch, the lower the friability and the higher the compressive strength.

#### 3.2.3 Mineral Fiber

The relationship between the density and thermal resistance properties of loose fill mineral fiber insulation varied substantially due to differences in fiber diameter, amount of unfiberized mineral and extent of nodular clumping. Accurate prediction of the thermal resistance of loose fill mineral fiber insulations relates to all the above factors and is not solely a factor of density.

#### 3.2.4 Installer and Contract

Concern has been expressed over the possibility of poor workmanship detracting from the effectiveness of the retrofit. Most contractors whose work was examined appeared to be making a conscientious effort to provide workman-like insulation retrofits. Labels or contracts stating a level of performance were available from 15 homeowners. Two contracts stated levels of performance by "R" factor, the remaining 13 contracts or labels stated performance levels by thickness. Five installations fell below contract statements, while ten installations exceeded performance levels. On the average, the contractors exceeded their stated performance levels by 11 percent. Settling of loose fill material or variations in installation density could account for the majority of the work found to be less than labelled. Although a small percentage of the retrofit insulation jobs observed were judged unsatisfactory, the majority of the contractors involved in this study did not appear to have attempted to misrepresent their products or services to the homeowner.

#### 3.2.5 Condition of Structure and Wiring

There is a degree of apprehension that retrofit insulation of existing homes may have deleterious effects on its structure or wiring. No evidence of deterioration or corrosion in the structural or wiring materials attributable to contact with the retrofit insulations was evident. The materials in this sample did not noticeably affect the structure or wiring of the observed homes.

#### 3.3 RECOMMENDATIONS

#### 3.3.1 Scope of Work

Future projects should be designed to represent a valid sample of retrofit insulation materials, manufacturers and installers. Larger numbers of samples should be taken with greater geographic distribution.

#### 3.3.2 Moisture Content and Vapor Barriers

Observations of wall and ceiling insulations should be made during the winter season to further appraise the accumulation and effects of moisture in attics and walls. Insulation samples should be taken and tested for moisture content. Moisture content should be correlated with the type and amount of venting.

#### 3.3.3 Insulation Installation and Settling

More extensive evaluation of the installation of the retrofit insulations and the potential for settling - particularly in loose fill insulations - should be made. This can be economically accomplished through the use of thermography. Representative areas of voids or settling should then be opened for further observation and testing.

#### 3.3.4 Corrosion

A more rigorous examination of the potential for corrosion of metals in contact with insulation materials should be made. This can be accomplished in the field by placing metal test coupons in wall and attic insulation, allowing them to remain in place for an extended period of time, removing and examining them.

#### 3.3.5 Test Density for Cellulose Loose Fill

The thermal resistance measurements indicated that the cellulosic materials were close to accepted or reference values. However, the practice of cellulosic insulation manufacturers is to have the thermal resistance determined at densities of 2 to 2.5 lbs  $\rm ft^{-3}$ . As indicated in this study, the insulation was usually at densities in excess of 3 lbs  $\rm ft^{-3}$ . Thus, the thermal resistance values represented for cellulose insulation are, in general, slightly high, not because the values are incorrect for the actual test density, but because the settled densities are higher than the test densities for both wall and ceiling. The test density for a cellulosic loose fill should be the settled density.

#### 3.3.6 Labelling and Contract Performance Statements

Most labels or contract performance statements reviewed during the study were in terms of inches of retrofit insulation. Retrofit insulation contracts would be more meaningful (in terms of energy saving) if related to resistance to thermal transmission instead of inches of thickness.

TABLE 3.1 SUMMARY FINDINGS

Material	Number of Samples	· ·		DENSITY 1bs ft <sup>-3</sup>		THERMAL RESISTANCE (R) per inch Btu <sup>-1</sup> hft <sup>2</sup> degF		% MOISTURE		RELATIVE FLAMMABILITY	% SHRINKAGE	
Ма	Nur Sar	range	aver.	range	aver.	range	aver.	range	aver.	Control Equiv.	range	aver.
Cellulose Walls	6	0-2	1.50	3.3 - 3.9	3.65	2.6 - 3.6	3.4	less than 1% to 6%	3%	Average sim. to ClassII labelled material	N/A	N/A
Cellulose Ceilings	15	0 <b>-</b> 18	3.17	1.8 - 3.8	3.15	3.3 - 3.8	3.5	less than 1% to 6%	2%	Average sim. to ClassII labelled material	N/A	N/A
UF Walls	12	0-4	1.85	0.5 <b>-</b> 1.05	0.8	2.5 - 4.5	4.0	1% - 12%	5%	None	2.5% - 9%	4 <b>.</b> 5%
UF Ceilings	1	1.6	1.6	.05	.05	4.2	4.2	2%	2%	None	4%	4%
Loose fill Glass fiber Walls	3	.5 - 3.4	1.95	1.3 - 4.4	2.55	2.8 - 3.7	3 <b>.</b> 3	less than 1%	less than 1%	None	N/A	N/A
Loose fill Glass fiber Ceilings	24	.5 <b>-</b> 14	2.63	1.25 - 4.2	2.24	2.35 - 3.85	3.34	less than 1% to 2%	1%	None	N/A	N/A
Glass fiber Batt Ceilings	4	1.2 -	1.9	0.7 <b>-</b> 2.7	1.48	3.2 - 4.3	3.7	less than 1% to 2%	1%	None	N/A	N/A
Rock∕SlagWool Walls	1	2	2	7.0	7.0	3.45	3.45	less than 1%	less than 1%	None	N/A	N/A
Rock∕SlagWool Ceilings	4	.17 - 10	3.23	1.5 - 6.7	4.43	2.95 - 3.45	3.28	less than 1% to 4%	2%	None	N/A	N/A

NOTE: N/A = Not applicable

#### 4. MATERIALS STUDIED

Three types of retrofit insulation were studied: (4.1) cellulosic loose fill, (4.2) urea-formaldehyde foam, and (4.3) mineral fiber. For background information, the following descriptions of the manufacture and application are given.

#### 4.1 Cellulosic Loose Fill Insulation

Cellulosic loose fill insulation is manufactured from waste paper materials - primarily newspaper - by macerating until a fibrous fluffy product results. In a continuous process the material is treated with flame retardant chemicals such as boric acid and then is bagged for distribution. The insulation is applied by blowing it pneumatically through a hose either inserted into a hole or opening in a wall or attic or by blowing it to a desired depth in an attic.

#### 4.2 Urea-formaldehyde

Urea-formaldehyde foam is mixed on-site from components such as resin, catalyst, foaming agent and flame retardant at the nozzle using a water carrier and compressed air. The foaming agent and catalyst mixture is generally pumped into a gun where the compressed air mixes with it and mechanically expands it into a foam consisting of small bubbles. The resin is introduced into the gun through a separate line and coats the foam bubbles. The nozzle of the gun is inserted into a hole in the wall and the foam is forced out of the gun and into the wall cavity under pressure. Setting up occurs in seconds although complete curing may require weeks.

#### 4.3 Mineral Fiber Insulation

Mineral fiber insulation can be divided into two groups, glass fiber and rock/slag wool. Glass fiber is made by melting high silica containing materials and spinning glass fibers from the molten material. Rock/slag wool is made by essentially the same process but the raw materials contain a lesser percentage of silica. In general, the raw material for glass fiber is sand while the raw material for rock/slag wool might be slag left over from a steelmaking process. The retrofit application of the material is essentially the same as for cellulose except that the pneumatic machinery is more powerful.

#### 5. PROJECT ORGANIZATION AND FIELD WORK

#### 5.1 TEST SUBJECT IDENTIFICATION

Owners of retro-insulated homes were located through utility company records and from call-in volunteers. Northern States Power Company, a local electrical utility involved in financing insulation retrofits of homes in the Minneapolis/St. Paul metropolitan area, generously provided access to their records for this project. The homeowners identified in these records were contacted and requested to participate in the project. Other volunteers were solicited through the use of form letters sent to local companies and public groups. The letter requested that owners of retro-insulated homes contact the Minnesota Energy Agency if they wished to volunteer for this test program.

The project team anticipated that the use of call-in volunteers may produce a biased sample. The team expected that these volunteers wanted their insulation tested because they suspected the quality of their job. A review of the field observations and laboratory test results indicated no evidence of such bias. The quality of the samples from call-in volunteers was distributed in a similar way to that of the homeowners identified through the utility records.

The project did not make use of the records of the various insulation manufacturers, suppliers and contractors located in the Twin Cities area. If a project of larger scope were to be undertaken, these records could facilitate the establishment of a large sample population.

#### 5.2 SUBJECT SELECTION

Homeowners were selected on the basis of the type of retrofit insulation used and whether it was installed in the wall or ceiling. Although the project attempted to select a specific distribution of insulating materials, locations and ages, the actual distribution of samples was governed by the availability of volunteer homeowners. Table 5.1 illustrates the attempted and actual distribution of samples.

Selection of test subjects was complicated by the frequent inability of the homeowner to properly identify the insulation material with which his home had been retrofitted. Table 5.2 illustrates the distribution of volunteers, observations made and samples taken.

#### 5.3 FIELD WORK

Once volunteer homeowners had been identified, the field crew was scheduled to arrive at the site on a date and time convenient to the homeowner. The field inspection team included the project manager, the field contractor and an assistant for wall observations — ceiling observations were made by the contract project manager and an assistant. As the field team arrived at the residence, they identified themselves to the homeowner and proceeded with the work. During a wall evaluation, an area was located where the work could be performed with no damage to the home itself. Where possible, the sample was taken from the north side of the house on the assumption that moisture content may be greater there than on the sides exposed to the summer sun.

In most cases, the wall samples were taken by removing the exterior siding, building paper and sheathing from the homes. Where this could not be done, as in the case of masonry or stucco exteriors, the samples were taken by cutting away part of the interior wall in an inconspicuous and easily repaired area. After removing the test sample, insulation compatible with the retrofit insulation was installed (either glass fiber or pre-formed urea-formaldehyde). The house was then repaired, patched and repainted to the owner's satisfaction.

Ceiling samples were obtained in a location of average depth. In cases where the insulation was below floor boards, the floor boards were removed to expose an adequate sample area. Labels affixed by the insulation contractor were copied for content. Again, the area was reinsulated and repaired to the owners satisfaction.

Photographs were taken to document each stage of the work. A worksheet was prepared containing a sketch of the sample area and the observations and data taken.

#### 5.4 FIELD OBSERVATIONS AND MEASUREMENTS

The following observations and measurements of the wall and ceiling sample areas were made:

- Orientation the exposure of the wall from which the sample was taken (north, east, west, south)
- Heating system the heating system and fuel type (gas, hot water, oil forced air, etc.)
- Plan location the room adjacent to the sample (kitchen, bedroom, bath etc.)
- Venting in attics, the general adequacy of the venting (good, average, minimal, none) related to the HUD minimum property standards; in walls the mechanical venting of a kitchen, bath or laundry adjacent to the sample area
- Framing type the structural system of the home (stud wall, joist and rafter attic, etc).
- Condition of structure the condition of the general structure and particularly of the structure in the sample area
- Condition of wiring the condition of the conduit, wiring boxes, and exposed wiring related to their exposure to insulation
- Original and retrofit insulation and vapor barrier types the type and location of vapor barriers originally in the wall or ceiling or added during retrofit
- Retrofit installation procedures and problems the method of insulation installation and obvious problems encountered by the contractor during the retrofit.
- Odor, vermin, moisture, fungus examining the sample for signs of odor, moisture, vermin activity or fungus growth
- Packing pressing the sample area to estimate compaction

Friability - crumbling the material by hand to estimate its tendency to pulverize

Measurements - measuring the size of the insulation sample area with a steel tape and probing with a micrometer in several locations to determine depth; measuring the width of shrinkage cracks with a steel tape.

Total shrinkage was calculated as a percent of original specimen.

Dimension:

width of shrinkage cracks x 100 cavity width = shrinkage %

Flammability - forming a hand sized ball of the insulation material, dropping a lighted paper match into a depression in the sample and observing any tendency of the material to ignite and sustain combustion

#### 5.5 SAMPLE HANDLING

After making all field observations, the insulation sample was removed, placed in double polyethylene bags and sealed to assure retention of moisture content. The samples were shipped to Dynatech Laboratory in fiberboard shipping barrels.

#### 5.6 HOMEOWNER AND CONTRACTOR INTERVIEW

The homeowner was interviewed to ascertain the age of the home, the contractor who installed the material, the contract terms of the insulation, and the actual date of the retrofit installation.

The installing contractor was contacted to ascertain the manufacturer of the insulation material installed in the home.

#### 5.7 HOMEOWNER FOLLOW-UP

At the termination of the project, the homeowner was provided with the photographs of his test, the on-site worksheet and the lab worksheet generated from his sample, a definition of the worksheet terms and the average results of the study.

#### TABLE 5.1

#### SAMPLE DISTRIBUTION

Insulation		Number		Age 0-2 Years		Age Over 2 Years	
Material	Location	Planned	Actual	Planned	Actual	Planned	Actual
Cellulose	Wall	8	6	4	6	4	0
	Ceiling	25	15	13	9	12	6
Urea -	Wall	8	12	4	9	4	3
Formaldehyde	Ceiling	0	1	0	1	0	0
Mineral	Wall	8	4	4	4*	4	0
Fiber	Ceiling	25	32	13	13	12	19
TOTAL		74	70	38	42	36	28

#### NOTE:

One mineral fiber wall insulation was of unknown age and has been arbitrarily included in the 0-2 year age bracket due to assumptions of age made by the owner.

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#### SUBJECT DISTRIBUTION

Method of Homeowner Identification	Number of Subjects Identified	Number of Field Observations Made	Number of Samples Analyzed	
from utility records	77	30	28 (1)	
call-in volunteers	40 (3)	44 <sup>(3)</sup>	42 <sup>(2)</sup>	
TOTAL	117	74	70	

#### NOTES:

- 1 Two wall samples were opened that could not be tested. In one case, no retrofit insulation had been installed in the cavity; in the other case, existing glass fiber batt precluded the installation of insulation.
- 2 Two wall samples were opened that were not included in the sample. In one case, there was a very limited amount of retrofit material in the cavity; in the other case, the retrofit had been made with polystyrene chips and was outside the scope of the survey.
- The difference in the number of subject identified and the number of field observations made may be accounted for by the fact that samples of both wall and ceiling insulations were taken from several homes.

#### 6. LABORATORY PROPERTIES STUDIED

The laboratory properties studied for each material were density, thermal resistance, moisture content and relative flammability. A microscopic examination was made of each material. A measurement of friability and compressive strength were also performed for the urea-formaldehyde foam insulation.

#### 6.1 DENSITY

The density of a material is its mass to volume ratio or stated simply — the weight of a specific volume of the material. For insulations, density is an important property since both the integrity of the insulation fill and the thermal resistance of the insulation are related to the density. An insulation installed at densities within performance guidelines will yield the maximum in thermal efficiency. For loose fill materials applied in walls or attics, densities below acceptable levels will create conditions that can lead to settling and opening of voids within the wall cavity. Knowledge of the settled densities of loose fill materials is a requirement for proper insulation.

#### 6.2 THERMAL RESISTANCE

The thermal resistance of an insulation per unit thickness is a measurement of a material's thermal performance under laboratory conditions. This measurement implies the actual field performance of the insulation. The actual performance of an insulation in the field must be understood in terms of the insulation being part of a system. The system is subject to moisture, settling, and shrinkage. These conditions affect the heat transfer of the system even though the thermal resistance of the insulation may not change.

The thermal resistance of cellulosic loose fill insulation and urea-formal-dehyde foams does not vary appreciably from manufacturer to manufacturer. For cellulosic loose fills and urea-formaldehyde foams the measured thermal resistance can be used to evaluate the quality of the insulation by comparing the measured values to typical curves of thermal resistance versus density. Figures 6.1 and 6.2 give typical values for cellulose and urea-formaldehyde. The typical data can be used as a yardstick to indicate the insulation quality or deterioration.

For mineral fiber insulations, the data does not fit a reference curve as do cellulose and urea-formaldehyde because of the variability of mineral fiber insulations. Because the raw material from which the mineral fiber insulations are made varies and because there are differences in manufacturing processes, the physical states of the insulations are dissimilar. For example, there are differences in fiber diameter, amount of unfiberized material and amounts of nodular clumping. These differences affect the thermal resistance and negate the use of a close-fitting reference curve.

#### 6.3 MOISTURE CONTENT

The moisture content of an insulation can indicate problems with vapor transfer. High moisture content within an insulation can adversely affect the thermal performance and can cause deterioration of other insulation properties by creating suitable conditions for settling and for leaching out of chemicals.

#### 6.4 RELATIVE FLAMMABILITY

The relative flammability of a material is a technique for ranking the flammabilities of a material within a group. It does not relate to other techniques for flammability measurement nor does it suggest values of absolute flammability. The values yield comparative data when matched against control samples.

#### 6.5 MICROSCOPIC EXAMINATION

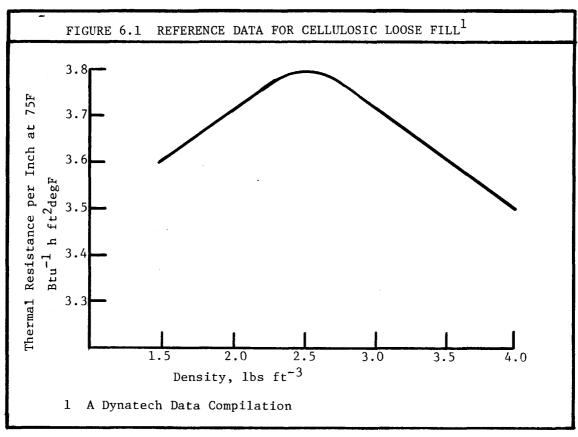
A microscopic examination was performed on each sample of insulation. The purpose of this examination was to determine if there was evidence of microscopic contamination of the insulation such as the presence of fungus. Presence of fungus in the materials, especially cellulose, can indicate that the material properties are deteriorating and that the material may present a health hazard.

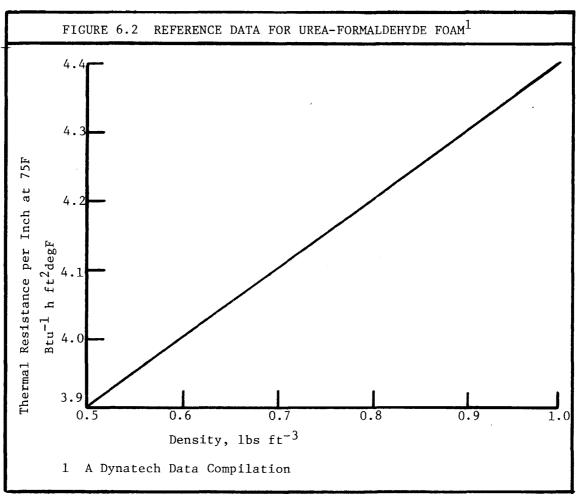
#### 6.6 FRIABILITY

There are reports that urea-formaldehyde foam insulation degrades under conditions of high humidity. The degradation is reported to proceed as a continuous depolymerization and the foam eventually becomes powder. In order to study this degradation, a measurement of friability was performed.

#### 6.7 COMPRESSIVE STRENGTH

Measurements of the compressive strength of the urea-formaldehyde foam were performed in order to study the structural integrity and discern evidence of degradation.





#### 7. LABORATORY EXPERIMENTAL PROCEDURES

#### 7.1 DENSITY

The density of the loose fill materials, both cellulose and mineral fiber, were determined from the volume of the sample measured and recorded during sample removal. A cross-sectional area of either wall or ceiling was marked off and measured. The average thickness of the area was then determined by a depth gauge. The sample was placed in double polyethylene bags and sent to Dynatech. At Dynatech the sample material was weighed and the density calculated from the mass and the volume given by the in situ recorded length, width and depth as shown below:

$$D = \frac{m}{(1)(w)(d)}$$

where

D = density

m = mass of material submitted in polyethylene bags

1 = length of selected cavity section

w = width of cavity

d = average depth of insulation section

The density of the urea-formaldehyde foam was determined by milling a  $2 \times 12 \times 12$  inch specimen, when possible, from the supplied sample removed from the wall and packed in double polyethylene bags. The density was determined from:

$$D = \frac{m}{v}$$

where

D = density of prepared sample

m = mass of prepared sample

v = volume of prepared sample

#### 7.2 THERMAL RESISTANCE

The thermal resistance of the urea-formaldehyde foam samples was determined with ASTM C518-76, "Steady State Thermal Transmission Properties by Means of the Heat Flow Meter", using a Dynatech Rapid-K apparatus. The upper and lower plates of the instrument were 12 x 12 inch blackened aluminum sinks, containing heaters which were temperature controlled with proportional/reset temperature controllers. Both plates were instrumented with Type T thermocouples. The bottom plate, or cold face, was instrumented with a calibrated heat flux transducer. The temperatures of the upper and lower plates were

controlled at 93 and 57 F respectively. At equilibrium, the thermal resistance per inch of the sample of urea-formaldehyde foam was determined from:

$$R = (q/A)^{-1} \left( \frac{T_h - T_c}{x} \right)$$

where q/A = heat flux as measured by the heat flow transducer

 $^{T}$ h = temperature of upper hot face

 $T_c$  = temperature of lower cold face

x = specimen thickness

The thermal resistance of the loose fill insulations, the cellulosic loose fills and the mineral fiber, were determined in accordance with ASTM C518-76, "Steady-State Thermal Transmission Properties by Means of a Heat Flow Meter", using a Dynatech R-Matic heat flow meter apparatus. The upper and lower plates of the instrument were 24 x 24 inch blackened aluminum sinks, containing heaters which were temperature controlled with proportional/ reset temperature controllers. Both plates were instrumented with a calibrated integrating heat flow transducer. The temperature of the upper and lower plates were controlled at 50 and 100 F respectively. The samples were placed within insulating containment rings, 3.5 inches thick for wall materials and 6 inches thick for ceiling materials. At equilibrium, the thermal resistance per inch was calculated as above.

#### 7.3 MOISTURE CONTROL

Duplicate 100 gram samples of the loose fill insulation were placed in tared evaporating dishes and weighed. The sample was placed in an air circulating oven at 110 C for 48 hours, removed, placed in a dessicator until cool and reweighed. The percent mass loss assumed to be moisture content was calculated as:

% moisture content = 
$$\frac{(m_i - m_f)}{m_i}$$
 (100)

where 
$$m_i$$
 = initial mass  $m_f$  = final weight

Duplicate nominally  $3 \times 3 \times 1$  inch specimens of urea-formaldehyde foam insulation were weighed and placed in an air circulating oven at 75 C for 48 hours, removed, placed in a dessicator until cool and reweighed. The percent mass loss assumed to be moisture content was calculated as above.

#### 7.4 RELATIVE FLAMMABILITY

The relative flammability is a measurement of the minimum volume percent of oxygen in an oxygen/nitrogen mixture that will support combustion. The apparatus consisted of a two-piece Pyrex glass column of 5 inch inside diameter and an overall height of 24 inches. The bottom section of the glass column contained 1/4 inch diameter glass beads in a bed 2 inches deep used to mix the inlet gases. The gases used were 99% purity oxygen and nitrogen obtained from regulated gas cylinders. The gas flow rates and volumes were regulated by precision calibrated rotometers. The gases were mixed prior

to entering the column by a T-fitting and 24 inches of tubing. The specimen igniter was a coiled platinum wire heated by a variable voltage supply.

A test consisted of placing the test specimen in stainless metal basket placed on top of the glass beads. The gases were mixed and allowed to flow through the column for a period of ten minutes prior to ignition. Ignition was performed by placing the platinum igniter wire in contact with the insulation. Power was supplied to the wire until ignition of the specimen occurred, usually requiring less than 5 seconds. Ignition of the specimen was designated as the presence of a flame. The igniter was disconnected from the power supply and raised above the specimen.

The criterion for establishing the relative flammability of a test specimen was the minimum percentage of oxygen necessary to support at flame for a period of one minute or until complete combustion of the material occurred. This level was ascertained by beginning the test program at 20% oxygen. The test was performed, the material discarded and another test made at an oxygen level 5% higher. This procedure was followed until the relative flammability was established. A duplicate test was then made and an average of the two test runs taken.

Three control measurements were made for the cellulosic loose fills, a macerated paper with no added chemicals, a sample from cellulosic loose fill labelled Class I and a sample of cellulosic loose fill labelled Class II. The cellulosic test samples were then compared to the controls and a control equivalency recorded. The control samples sustained combustion under the following conditions:

- A. Class I labelled material; 60% oxygen environment
- B. Class II labelled material; 40% oxygen environment
- C. Untreated material: 20% oxygen environment

#### 7.5 MICROSCOPIC EXAMINATION

Several small samples of each insulation specimen were examined for noticeable anomalies (trace of fungus or vermin activity) under a 40 X binocular dissecting scope. Observations by at least two laboratory technicians were carried out on each insulation sample.

#### 7.6 FRIABILITY

Twelve one-inch cubes of each sample of urea-formaldehyde foam were milled and weighed together. These were placed in an oak box containing twenty-four one-inch cubes of oak. The box was rotated at 60 rpm for 2 minutes. At the end of this period, the foam was sieved through a 1/4 inch mesh screen and the foam remaining on the screen was weighed. The friability of the material was measured as percent mass loss calculated as:

% Friability = 
$$\frac{(m_i - m_f) (100)}{m_i}$$

where  $m_i = initial mass$ 

 $m_f$  = mass remaining on screen

#### 7.7 COMPRESSIVE STRENGTH

Three 1 x 3 x 3 inch specimens of each sample of urea-formaldehyde foam were milled and measured. Each specimen was then tested in compression in the one-inch direction at a crosshead speed of 0.05 inches  $\min^{-1}$  using an Instron TT-C Universal Tester. The compressive strength at 10% deformation was calculated for each specimen and the average for the three determinations reported. The compressive strength was calculated from:

Compressive Strength =  $\frac{P}{A}$ 

where P = 10ad on specimen at 10% deformation

A = cross-sectional area of specimen

#### 8. TABULAR RESULTS

The major results of the field and laboratory work are presented in tabular form in tables 8.1 through 8.18. A discussion of these results will be found in the findings and conclusions section.

NOTES:

TABLE 8.1 CELLULOSIC LOOSE FILL WALLS - FIELD OBSERVATIONS

Sample Number	Original Insulation	Thickness Inches	Vapo Bar: Type	or rier Loc.	INSTALLATION PROCEDURES	STRUCTURAL BARRIERS	INSTALLATION PROBLEMS
2W	none	4.0	none ,	N/A	3/4" blowhole	plaster droppings in cavity	none
6W	none	3.0	felt	0	2 holes per cavity	convection barrier <sup>1</sup>	none
8W	none	3.3	shin- gles	0	1 hole per cavity	none	door framing not filled
15W	none	3.2	foil	0	unknown	none	none
23W	none	2.0	none	N/A	2 holes per cavity	none	frame and corner not filled
27W	none	2.2	none	N/A	unknown	none	none

A convection barrier is a device installed to reduce convection currents within a wall cavity. It is usually made of tar paper and stapled to the sides of the studs within the cavity, dividing it into two shallower segments of approximately 1 3/4" each.

#### Vapor Barrier Location

0 = outside of cavity

I = inhabited side of cavity

M = middle of cavityN/A = not applicable

TABLE 8.2 CELLULOSE LOOSE FILL WALLS LABORATORY PROPERTIES

Sample Number	e/Years	Density		Resistance lu <sup>-1</sup> h ft <sup>2</sup> deg	gF	Moisture Content	Relative Flammability	
Sar Nur	Age	lbs ft <sup>-3</sup>	Measured	Reference <sup>1</sup>	% Deviation	%	Control Equivalent	
2W	2	3.35	3.5	3.65	-4	. 6	Less than Class II labelled control material	
6W	1.75	3.30	3.6	3.65	-1	< 1	Similar to Class II labelled control material	
8W	1.00	3.75	3.6	3.55	+1	< 1	Similar to Class I labelled control material	
15W	2.00	3.90	3.15	3.55	-11	4	Similar to Class II labelled control material	
2 3W	1.33	3.80	3.25	3.55	-8	2	Less than Class II labelled control material	
27W	1	3.8	3.35	3.55	-6	2	Similar to Class II labelled control material	
Aver	age 1.5	3,65	3.4	3.6	<b>-</b> 5	3	Similar to Class II labelled control material	

1 Expected thermal resistance of this material at a specific density taken from the Dynatech compilation and presented as a curve in figure 6.1

NOTES:

TABLE 8.3 CELLULOSE CEILINGS - FIELD OBSERVATIONS

	·				Vapor Barrier	
Sample Number	Original Insulation	Insulation Thickness	Attic Venting <sup>1</sup>	Туре	Location	
1C	none	4.6" cellulose	minimal	none	not applicable	
11C	none	5.3" cellulose	none	none	not applicable	
12 <b>C</b>	mineral fiber loose fill	7.5" cellulose 1.0" original	minimal	none	not applicable	
13C	mineral fiber loose fill	4.5" total	none	none	not applicable	
17C	wood shavings	4.5" cellulose	none	none	not applicable	
21C	mineral fiber batt	10.1" cellulose 3.5" original	minimal	foil	between insulation layers	
23C	none	6.0" cellulose	minimal	none	not applicable	
26C	none	4.5" cellulose	none	none	not applicable	
27C	mineral fiber batt	5.8" cellulose 3.8" original	minimal	none	not applicable	
32C	mineral fiber batt	3.0" cellulose 2.0" original	minimal	paper	between insulation layers	
33C	wood fiber batt	3.5" cellulose 2.0" original	average	paper	inhabited side of cavity	

(Table 8.3 continued on Page 22)

TABLE 8.3 (cont.) CELLULOSE CEILINGS - FIELD OBSERVATIONS

				Vapo Barr	
Sample Number	Original Insulation	Insulation Thickness	Attic Venting <sup>1</sup>	Туре	Location
34C	mineral fiber loose fill	5.3" cellulose 3.0" original	average	none	not applicable
44C	mineral fiber batt	4.5" cellulose 3.0" original	minimal	foil	inhabited side of cavity
49C	mineral fiber loose fill	11.5" cellulose 1.0" original	minimal	poly	inhabited side of cavity
55C	none	5.3" cellulose	minimal	none	not applicable

OTES:

1 Attic ventilation was observed by the field crew and evaluated in relation to HUD Minimum Property Standards for 1 & 2 Family Dwellings 4900.1, which calls for a free ventilating area of 1/150 to 1/300 of the horizontal projection of the insulated ceiling area. Where no intentional or incidental (i.e. cracks in the soffit or roof boards) ventilation was obvious, the venting was considered "none". Where some evidence of ventilation was seen but was estimated at less than 1/300th of the insulated ceiling area. the venting was termed "minimal". When the ventilated area was estimated at between 1/300th and 1/150th of the insulated ceiling area, the ventilation was considered "average". When the ventilated area was estimated at 1/150th of the insulated ceiling or over, the ventilation was considered "good". Determination of the level of attic ventilation was made by visual estimate, since vent location and attic conditions made it impractical to take physical measurements in most cases.

TABLE 8.4	CELLULOSE	LOOSE FILL	CEILINGS	LABORATORY	PROPERTIES

Sample Number	Age/Years	Density 1bs ft <sup>-3</sup>	Thermal Resistance Per Inch  Btu <sup>-1</sup> h ft <sup>2</sup> deg F  Measured Reference % Deviation			Moisture Content %	Relative Flammability Control Equivalent
1C	.50	1 <b>.</b> 95	3.75	3.75	0 %	less than 1%	Less than Class II labelled control material
11C	3.00	5.00	3.35	3.30	+2 %	less than 1%	Similar to Class I labelled control material
12C	.75	3.50	3.50	3.60	- 3 %	less than 1%	Similar to Class I labelled control material
13C	1.50	3.50	3.80	3.60	+6 %	less than 1%	Similar to Class II labelled control material
17C	18.00	3.30	3.45	3.65	-5%	6%	Similar to Class II labelled control material
21C	2.00	1.80	3.40	3.75	-9%	5%	Similar to Class II labelled control material
23C	1.75	2.20	3.50	3.80	-8%	2%	Similar to Class II labelled control material
26C	1.50	2.60	3.45	3.80	-9%	2%	Similar to Class I labelled control material

(Table 8.4 continued on Page 24)

TABLE 8.4 (cont.) CELLULOSE LOOSE FILL CEILINGS LABORATORY PROPERTIES

Sample Number	Age/Years	Density lbs ft <sup>-3</sup>	Thermal Resistance Per Inch  Btu <sup>-1</sup> h ft <sup>2</sup> deg F  Measured Reference % Deviation			Moisture Content %	Relative Flammability Control Equivalent
27C	1.00	3.80	3.35	3 <b>.</b> 55	-3%	2%	Similar to Class II labelled control material
32C	.17	3.50	3.45	3.6	-4%	2%	Similar to untreated control material - Burns in air
33C	2.5	3.1	3.7	3.7	0%	2%	Less than Class II labelled control material
34C	11.0	3.6	3.6	3.6	0%	2%	Similar to Class II labelled control material
44C	3.33	2.4	3.35	3.8	-13%	less than 1%	Similar to Class II labelled control material
49C	.17	3.5	3.5	3.6	-3%	5%	Similar to untreated control material- Burns in air
55C	2.50	3.8	3.25	3.55	-8 %	less than 1%	Similar to Class II labelled control material
Aver	age 2.50	3.15	3.5	3.65	-4%	2%	Similar to Class II labelled control material

TABI	TABLE 8.5 UREA-FORMALDEHYDE WALLS - FIELD OBSERVATIONS								
Sample Number	Origianl Insulation	Thickness Inches	Vapor Barrier Type Loc.		INSTALLATION PROCEDURES	STRUCTURAL BARRIERS	INSTALLATION PROBLEMS		
1W	MFB	3.5	paper	М	unknown	none	none		
4 <b>W</b>	none	0.0	none	N/A	two holes per cavity	convection barrier	see note 1.		
7 <b>W</b>	none	3.3	foil	I	1½" hole midway up wall single hole/cavity	none	foam did not fill all cavities		
10W	none	3.7	none	N/A	multiple holes per cavity	odd framing	foam did not fill all cavities		
11W	none	1.9	none	N/A	one hole per cavity	lath and plaster interior - backplaster	none		
13W	MFL	3.3	none	N/A	two holes per cavity per story	convection barrier material in cavity	none		
17W	W	3.6	none	N/A	two holes per cavity per story	cavity filled with wood shavings	foam did not fill cavity		

(Table 8.5 continued on Page 26)

Sample Number	Original Insulation	Thickness Inches	Vapo Barr Type	ier	INSTALLATION PROCEDURES	STRUCTURAL BARRIERS	INSTALLATION PROBLEMS
24W	none	3.4	none	N/A	two holes per cavity per story	backplaster	none
25W	none	3.0	none	N/A	unknown	none	material appeared to set up layers
26W	none	2.8	none	N/A	unknown	backplaster	none
38W	none	3.5	none	N/A	two holes per cavity	none	none
40W	none	3.4	none	N/A	two holes per cavity	none	none
41W	none	3.3	none	N/A	one hole top of cavity	none	none

1. Foam not in all cavities, thin film of insulation in some cavities.

Original Insulation Types

MFL - mineral fiber loose-fill

MFB - mineral fiber batt

WFB - wood fiber batt

V - vermiculite

C - cork

W - wood shavings

Vapor Barrier Location

O = outside of cavity

I = inhabited side of cavity

M = middle of cavity

N/A = not applicable

TABLI	TABLE 8.6 UREA-FORMALDEHYDE WALLS LABORATORY PROPERTIES								
Sample Number	Age/Years	Density 1bs ft <sup>-3</sup>		Resistance -1 h ft <sup>2</sup> de Reference		Moisture Content %	Friability % Mass Loss	Compressive Strength at 10% Deflection lbs in	Shrinkage %
1W	.5	0.9	4.3	4.3	0	8	19	1.7	4
7W	2.0	0.65	3.8	4.05	<b>-</b> 6	2	19	1.0	(Note 1)
10W	1.17	1.05	4.2	4.45	-6	2	10	2.0	4
11W	3.0	0.6	4.0	4.0	0	1	59	(Note 3)	4
13W	1.5	0.9	3.45	4.3	-20	8	6	1.9	(Note 2)
17W	4.0	1.0	4.15	4.4	-6	5	37	2.6	(Note 1)
24W	1.0	0.5	3.9	3.9	0 .	4	24	0.2	4

(Table 8.6 continued on Page 28)

NOTES:

TABLE 8.6 (cont) UREA-FORMALDEHYDE WALLS LABORATORY PROPERTIEŞ

Sample Number	Age/Years	Density 1bs ft-3	Thermal Btu Measured	Resistance -1 h ft <sup>2</sup> de Reference		Moisture Content %	Friability % Mass Loss	Compressive Strength at 10% Deflection lbs in	Shrinkage %
25W	2.5	0.65	3.75	4.05	<b>-</b> 7	6	8	0.8	7
26 <b>W</b>	1.5	0.75	3.85	4.15	<b>-</b> 7	2	20	0.5	• 9
38W	•5	0.95	4.35	4.35	0	5	19	1.9	3
40 <b>W</b>	1.17	0.85	3.85	4.25	<b>-</b> 9	6	28	1.6	3
41W	.5	0.75	4.45	4.15	· <b>+</b> 7	8	25	2.2	2.5
Avera	ge 1.6	0.8	4.0	4.2	4.5	4.75	23	1.4	4 <b>.</b> 5

- 1 Incomplete fill of the cavity at the sample point made it impossible to make lateral shrinkage measurements
- 2 The configuration of a convection barrier in the cavity made it impossible to measure the horizontal shrinkage of the material
- 3 Material of insufficient dimension to perform test

TABLE 8.7 UREA-FORMALDEHYDE CEILINGS - FIELD OBSERVATIONS

				Vapor	Barrier
Sample Number	Original Insulation	Insulation Thickness	Attic Venting $^{ m l}$	Туре	Location
10C	none	3.7" retrofit	none	none	not applicable

Attic ventilation was observed by the field crew and evaluated in relation to <a href="HUD Minimum Property Standards">HUD Minimum Property Standards</a> for 1 & 2 Family Dwellings 4900.1, which calls for a free ventilating area of 1/150 to 1/300 of the horizontal projection of the insulated ceiling area. Where no intentional or incidental (i.e. cracks in the soffit or roof boards) ventilation was obvious, the venting was considered "none". Where some evidence of ventilation was seen but was estimated at less than 1/300th of the insulated ceiling area, the ventilated area was estimated at between 1/300th and 1/150th of the insulated ceiling area, the ventilation was considered "average". When the ventilated area was estimated at 1/150th of the insulated ceiling or over, the ventilation was considered "good". Determination of the level of attic ventilation was made by visual estimate, since vent location and attic conditions made it impractical to take physical measurements in most cases.

TABLE 8.8 UREA-FORMALDEHYDE CEILING LABORATORY PROPERTIE	TABLE	8.8	UREA-FORMALDEHYDE	CEILING	LABORATORY	PROPERTIES
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Sample Number	Age/Years	Density lbs ft <sup>-3</sup>	Btu	Resistance -1 h ft <sup>2</sup> de Reference		Moisture Content %	Friability % Mass Loss	Compressive Strength at 10% Deflection lbs in	Shrinkage %
10C	1.17	0.65	4.2	4.05	+4	2	58	0.6	4

NOTES:

Sample Number	Original Insulation	Thickness Inches	Vapo Barr Type		INSTALLATION PROCEDURES	STRUCTURAL BARRIERS	INSTALLATION PROBLEMS
3W	WFB	3.0	felt	0	unknown	none	did not fill corner
12W	none	1.5	none	N/A	unknown	heavy backplaster, shallow void	none
16Wa	none	0	none	N/A	unknown	complicated framing	no insulation in cavity
16Wb	none	3.8	poly	0	unknown	firestop	loose packing
18W	MFB	`0	none	N/A	two holes per cavity	batt insulation in cavity	no new insulation installed
			-				

Original Insulation Types

MFL - mineral fiber loose fill

MFB - mineral fiber batt

WFB - wood fiber batt

V - vermiculite

C - cork

W - wood shavings

Vapor Barrier Location

C = outside of cavity

I = inhabited side of cavity

M = middle of cavity

N/A = not applicable

TABLE 8.10 GLASS FIBER LOOSE FILL WALLS	LABORATORY	PROPERTIES
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Sample Number	Age Years	Density 1bs ft <sup>-3</sup>	Thermal Resistance Per Inch Btu <sup>-1</sup> h ft <sup>2</sup> deg F	Moisture Content %
3W	-	4.4	3.7	1
12W	3.4	1.95	3.4	1
16Wb	.5	1.3	2.8	1
Average	1.0	3.7	3.3	1

TABLE	8.11	LOOSE H	FILL GLASS	FIBER	CEILINGS	FIELD	<b>OBSERVATIONS</b>

					oor rrier								
Sample Number	Original Insulation	Insulation Thickness	Attic Venting	Туре	Location								
9C	mineral fiber batt	5.4" retrofit 1.9" original	minimal	none	not applicable								
16C	mineral fiber batt	3.3" retrofit 1.5" original	minimal	paper	inhabited side of cavity								
.18C	mineral fiber batt	7.5" retrofit	average	paper	inhabited side of cavity								
19C	mineral fiber loose fill	6.5" retrofit 2.5" original	good	paper	inhabited side of cavity								
20C	mineral fiber loose fill	7.5" retrofit 3.5" original	minimal	paper	inhabited side of cavity								
22C	none	7.4" retrofit	average	poly <sub>.</sub>	inhabited side of cavity								
29C	none	7.3" retrofit	average	none	not applicable								
30C	mineral fiber loose fill	5.8" retrofit 3.0" original	average	paper	inhabited side of cavity								
31C	mineral fiber loose & batt	5.3" retrofit 5.3" original	good	paper	inhabited side of cavity								
35C	mineral fiber loose fill	7.8" retrofit 3.5" original	minimal	paper	inhabited side of cavity								
36C	mineral fiber batt	6.5" retrofit 5.5" original	minimal	poly	inhabited side of cavity								
37 <b>C</b>	wood fiber loose fill	10.0" retrofit 2.5" original	good	paper	inhabited side of cavity								
38C	vermiculite	13.3" retrofit 2.8" original	good	none	not applicable								
39C	mineral fiber loose fill	10.0" retrofit 2.0" original	good	paper	inhabited side of cavity								
43C	mineral fiber loose fill	9.3" retrofit 1.0" original	good	paper	inhabited side of cavity								
	(Table 8.11 cont	inued on Page 33)			(Table 8.11 continued on Page 33)								

TABLE 8.11 (cont.) LOOSE FILL GLASS FIBER CEILINGS - FIELD OBSERVATIONS

				Va <sub>I</sub> Bai	oor rrier
Sample Number	Original Insulation	Insulation Thickness	Attic Venting	Туре	Location
45 <b>C</b>	mineral fiber batt	4.3" retrofit 2.0" original	minimal	paper	inhabited side of cavity
46C	wood fiber batt	8.5" retrofit 2.5" original	average	paper	inhabited side of cavity
47C*	wood fiber batt	6.5" retrofit 2.0" original	average	paper	inhabited side of cavity
48 <b>C</b>	mineral fiber batt	6.8" retrofit 3.0" original	minimal	paper	inhabited side of cavity
50C	mineral fiber loose fill	5.5" retrofit 6.5" original	good	poly	inhabited side of cavity
51C	mineral fiber loose fill	6.5" retrofit 3.5" original	average	paper	inhabited side of cavity
52C	mineral fiber loose fill	8.8" overall	good	paper	inhabited side of cavity
53C	mineral fiber loose fill	5.5" retrofit 5.0" original	good	foil	inhabited side of cavíty
54C	mineral fiber loose fill	8.0" retrofit 3.5" original	average	paper	inhabited side of cavity

1 Attic ventilation was observed by the field crew and evaluated in relation to HUD Minimum Property Standards for 1 & 2 Family Dwellings 4900.1, which calls for a free ventilating area of 1/150 to 1/300 of the horizontal projection of the insulated ceiling area. Where no intentional or incidental (i.e. cracks in the soffit or roof boards) ventilation was obvious, the venting was considered "none". Where some evidence of ventilation was seen but was estimated at less than 1/300th of the insulated ceiling area, the venting was termed "minimal". When the ventilated area was estimated at between 1/300th and 1/150th of the insulated ceiling area, the ventilation was considered "average". When the ventilated area was estimated at 1/150th of the insulated ceiling or over, the ventilation was considered "good". Determination of the level of attic ventilation was made by visual estimate, since vent location and attic conditions made it impractical to take physical measurements in most cases.

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TABLĖ 8.12 I	LOOSE FILL	GLASS FIBER	CEILINGS LABORATORY PROPERTIES	S
Sample Number	Age Years	Density  1bs ft3	Thermal Resistance Per Inch  Btu <sup>-1</sup> h ft <sup>2</sup> deg F	Moisture Content %
9C	2.0	2.2	3.85	1
16C	.5	2.2	3.85	1
18C	.75	1.3	3.25	1
19C	3.0	2.4	3.05	2
20C	3.0	2.1	3.05	1
22C	14	3.4	3.05	1
29C	1.0	1.25	2.35	1
30C	2	1.5	3.05	1
31C	1.5	1.7	3.35	1
35C	2.0	2.35	3.0	1
36C	1.0	4.2	3.7	1
37C	2.0	1.4	2.95	1
38 <b>C</b>	.5	2.9	3.75	1
39C	2.0	2.05	3.45	1
43C	3.5	1.7	3.25	1
45C	3.17	2.4	3.7	2
46C	2.0	1.4	3.25	2

(Table 8.12 continued on Page 35)

Table 8.12 (cont.) LOOSE FILL GLASS FIBER CEILINGS LABORATORY PROPERTIES

Sample Number	Age Years	Density lbs ft <sup>-3</sup>	Thermal Resistance Per Inch ${ m Btu}^{-1}$ h ${ m ft}^2$ degF	Moisture Content %
47C	3.0	2.3	3.45	1
48C	3.0	1.6	3.15	1
50C	3.0	2.95	3.7	1
51C	1.0	2.15	3.45	2
52G	3.0	2.5	3.7	1
53C	3.25	3.55	3.45	2
54C	3.0	2.35	3.35	2
Average	2.63	2.24	3.34	1 .

TABLE 8.13 ROCK/SLAG WOOL WALLS - FIELD OBSERVATIONS								
Sample Number	Original Insulation	Thickness Inches	Vapo Barr Type		INSTALLATION PROCEDURES		STRUCTURAL BARRIERS	INSTALLATION PROBLEMS
9W	MFB	2.7	paper	I	unknown		none	did not fill at window
NOTES:								

TABLE 8.14 ROCK/SLAG WOOL LOOSE FILL WALLS LABORATORY PROPERTIES						
Sample Number	Age Years	Density lbs ft <sup>-3</sup>	Thermal Resistance Per Inch Btu <sup>-1</sup> h ft <sup>2</sup> deg F	Moisture Content %		
9W	2	7.0	3.45	1		

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TABLE 8.15	ROCK/SLAG WOO	OL CEILINGS -	FIELD OBSERVATIONS		
				Vapor	Barrier
Sample Number	Original Insulation	Insulation Thickness	Attic Venting <sup>1</sup>	Туре	Location
8C	none	5.0" retrofit	average	none	not applicable
14C	none	4.5" total	average	none	not applicable
15Ca	wood fiber batt	3.7" total	average	paper	inhabited side of cavity
42C	wood fiher batt	9.0" retrofit 7.3" original	good	poly	inhabited side of cavity
	to <u>HUD Minimum Pro</u> j	on was observed by the fig perty Standards for 1 & 2 ting area of 1/150 to 1/30	Family Dwellings	4900.1, wh	nich calls

1 Attic ventilation was observed by the field crew and evaluated in relation to HUD Minimum Property Standards for 1 & 2 Family Dwellings 4900.1, which calls for a free ventilating area of 1/150 to 1/300 of the horizontal projection of the insulated ceiling area. Where no intentional or incidental (i.e. cracks in the soffit or roof boards) ventilation was obvious, the venting was considered "none". Where some evidence of ventilation was seen but was estimated at less than 1/300th of the insulated ceiling area, the venting was termed "minimal". When the ventilated area was estimated at between 1/300th and 1/150th of the insulated ceiling area, the ventilation was considered "average". When the ventilated area was estimated at 1/150th of the insulated ceiling or over, the ventilation was considered "good". Determination of the level of attic ventilation was made by visual estimate, since vent location and attic conditions made it impractical to take physical measurements in most cases.

TABLE 8.16 ROCK/SLAG WOOL LOOSE FILL CEILINGS LABORATORY PROPERTIES

Sample Number	Age Years	Density -3 lbs ft.	Thermal Resistance Per Inch  Btu <sup>-1</sup> h ft <sup>2</sup> deg F	Moisture Content %
8C	unknown	6.7	3.35	1
14C	10	5.0	2.95	2
15Ca	<b>'2.</b> 75	4.5	3.35	4
42C	.17	1.5	3.45	1
Average	3.23	4.43	3.28	2

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TABLE 8.17 GLASS FIBER BATT CEILINGS - FIELD OBSERVATIONS					
				Vapor	Barrier
Sample Number	Original Insulation	Insulation Thickness	Attic Venting <sup>1</sup>	Туре	Location
15СЬ	mineral fiber batt	7.5" retrofit	average	poly	inhabited side of cavity
24C	cork/mineral fiber loose	8.0" retrofit 4.0" original	minimal	none	not applicable
25C	none	6.0" retrofit	minimal	none	not applicable
28C	wood fiber batt	3.5" retrofit 2.0" original	good	none	not applicable

1 Attic ventilation was observed by the field crew and evaluated in relation to <a href="HUD Minimum Property Standards for 1 & 2 Family Dwellings 4900.1">HUD Minimum Property Standards for 1 & 2 Family Dwellings 4900.1</a>, which calls for a free ventilating area of 1/150 to 1/300 of the horizontal projection of the insulated ceiling area. Where no intentional or incidental (i.e. cracks in the soffit or roof boards) ventilation was obvious, the venting was considered "none". Where some evidence of ventilation was seen but was estimated at less than 1/300th of the insulated ceiling area, the venting was termed "minimal". When the ventilated area was estimated at between 1/300th and 1/150th of the insulated ceiling area, the ventilation was considered "average". When the ventilated area was estimated at 1/150th of the insulated ceiling or over, the ventilation was considered "good". Determination of the level of attic ventilation was made by visual estimate, since vent location and attic conditions made it impractical to take physical measurements in most cases.

Sample Number	Age Years	Density 1bs ft.	Thermal Resistance Per Inch Btu h ft deg F	Moisture Content %
15СЪ	2	.65	3.15	2
24C	1.2	2.65	4.25	1
25C	2.5	.6	3.3	1
28C	2.0	2.0	4.1	1
Average	1.93	1.48	3.7	1

## 9. FINDINGS AND CONCLUSIONS

#### 9.1 CORRELATIONS

## 9.1.1 General Findings

The results of the field observations made and the laboratory properties studied were analyzed for possible cross-correlations. Where mathematical correlations could be drawn (such as between shrinkage of urea-formaldehyde foam and age of retrofit), a calculation of correlation coefficients was determined using a Hewett Packard Calculator and curve-fitting programs 03-01.

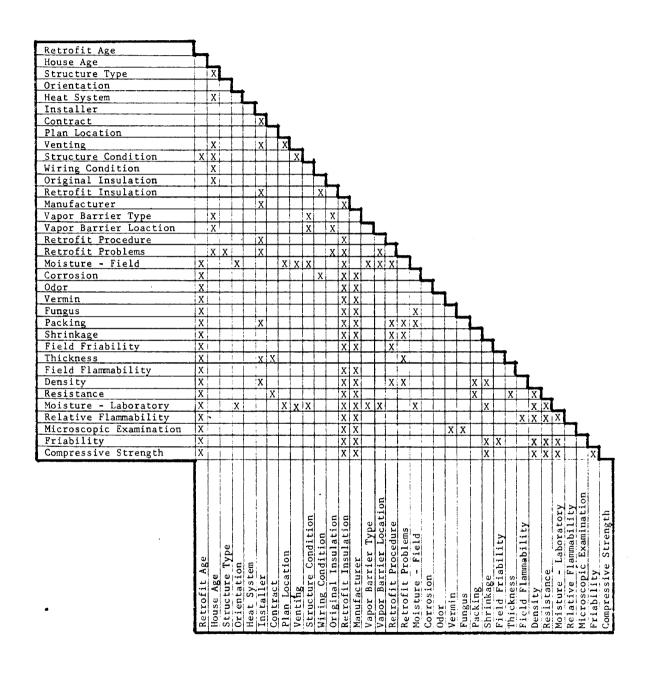
Where no mathematical correlations could be drawn (such as between original insulation type and retrofit problems), the results were tabulated and examined forapparent pattern. Table 9.1 illustrates the various interrelationships between the elements of the field and laboratory work. An X marking the intersection of two elements indicates that a relationship between those elements was investigated.

### 9.1.2 General Conclusions

No relevant correlations between the following properties and any other property were evident:

Orientation
Heating System
Structure Type
Plan Location
Retrofit Procedures
Age of Home
Original Insulation

All other conclusions regarding correlations will be found in following sections.



#### 9.2 CELLULOSIC LOOSE FILL INSULATION

## 9.2.1 Findings - Wall Applied Cellulosic Loose Fill

Six samples of wall applied cellulosic loose fill were taken with an age spread of from 1 to 2 years with an average age of 1.5 years. The density spread was from 3.3 to 3.9 lbs  $ft^{-3}$  with an average density of 3.65. The thermal resistances per inch varied from 3.15 to 3.6  $Btu^{-1}$  h  $ft^2$  degF with an average of 3.4. Based on a reference curve of thermal resistance versus density, the average of the values was within 5% of the expected value. The moisture contents varied from less than 1% to 6% with an average of 3%. One material was similar to the Class I labelled control and three to the Class II labelled control. The other samples were more flammable than the Class II labelled control. The microscopic examination showed no presence of fungus. The results are shown in Table 8.2.

## 9.2.2 Findings - Ceiling Applied Cellulosic Loose Fill

Fifteen samples of ceiling applied cellulosic loose fill were taken with an age spread of from 2 months to 18 years with an average age of 3.3 years. The density spread was from 1.8 to 5 lbs  $ft^{-3}$  with an average density of 3.15. The thermal resistance per inch varied from 3.25 to 3.8 Btu $^{-1}$  h ft $^2$ degF with an average of 3.5. Based on an accepted curve of thermal resistance versus density, the average of the values was within 4% of the expected The moisture contents varied from less than 1% to 6% with an average of 2%. Three of the samples were similar to the Class I labelled control and seven to the Class II labelled control. One sample exhibited flame retardant properties and four samples had little if any flame retardant properties. Two of these samples burned completely while the other two samples exhibited a lingering flame but self-extinguished when ignited by a match in the field. The microscopic examination showed no presence of The results are summarized in Table 8.4. fungus.

## 9.2.3 Conclusions

The average density of the cellulosic loose fill insulations was greater than the coverage densities given by the cellulose manufacturers on the bags. This occurred because of settling or because the cellulose was applied at greater densities.

The thermal resistance values averaged 4% less than the reference values. The thermal resistance of the cellulosic loose fills did not deteriorate with time; the oldest cellulose samples possessed similar thermal resistance characteristics to the average of all cellulose samples.

The moisture content of cellulosic loose fills averaged 2%, which means that the cellulosic was very dry. Either this is typical of cellulose or the material dried substantially during the spring prior to sampling. Sampling during the winter months will yield more information about moisture conditions.

One-third of the cellulose samples tested were more flammable than the Class II labelled control. About one-fifth of the cellulose samples could be ignited with a match and would continue burning. This percentage of flammable cellulose samples should be a concern.

No fungi were detected growing within the cellulose.

No deterioration with age occured with any measured property.

#### 9.3 UREA-FORMALDEHYDE FOAM

#### 9.3.1 Findings

Twelve samples of wall applied urea-formaldehyde foam were removed with an age spread of from 6 months to 4 years, with an average of 1.6 years. Since urea-formaldehyde foam is not typically applied to ceilings, only one ceiling sample was taken and the results considered together with the wall samples.

The density spread was from 0.5 to 1.05 lbs  $\mathrm{ft^{-3}}$  with an average 0.8 lbs  $\mathrm{ft^{3}}$ . The average of the thermal resistance values were within 4% of the reference values based on the data in Figure 6.2 and varied from 3.45 to 4.45 Btu<sup>-1</sup>h  $\mathrm{ft^{2}}$  deg F. The average thermal resistance was 4.0 Btu<sup>-1</sup>h  $\mathrm{ft^{2}}$  deg F. As the density increased, the moisture content and compressive strength increased. And as the density increased, the friability decreased. The moisture content varied from 1 to 12% and correlated positively with density and compressive strength and, negatively with friability. The friability varied from 6 to 59% and correlated negatively with moisture content and density. The friability of the ceiling sample was one of the highest observed at 58% mass loss. The compressive strength varied from 0.2 to 2.6 lbs  $\mathrm{ft^{-3}}$  and correlated positively with density and moisture content. The relative flammability of all urea-formal-dehyde foam samples was non-burning. A microscopic examination of the material showed no anomalies. The results are given in Tables 8.6 & 8.8.

#### 9.3.2 Conclusions

The density of the urea-formaldehyde foam insulations averaged 0.8 lbs ft<sup>-3</sup>. One sample was 0.5 lbs ft<sup>-3</sup>; the others were 0.6 and greater. The properties of the foam correlated with density; the higher the density, the higher the thermal resistance and compressive strength, the lower the friability.

The thermal resistance values average 4% less than the reference values. The thermal resistance of the urea-formaldehyde foams did not deteriorate with age.

All foam samples exhibited shrinkage. The shrinkage did not correlate with time; that is, the older samples did not have the highest shrinkage. The shrinkage exhibited varying cross-sectional shape. Foam installed during the winter months showed greater contraction at the outside cold surface than at the inside warm suface, while summer installations appeared to contract equally between inside and outside surfaces. The total amount of shrinkage did not relate to season of installation.

The friability and compressive strength of the foam samples correlated with density but not with age. The foam samples did not deteriorate with time.

#### 9.4 MINERAL FIBER INSULATIONS

## 9.4.1 Wall Applied Mineral Fiber Insulations

Four samples of mineral fiber insulation were removed with an age spread of 6 months to 2 years with one unknown. The densities varied from 1.3 to 7.0 lbs  $\rm ft^{-3}$  and the thermal resistances, from 2.8 to 3.7  $\rm Btu^{-1}h$   $\rm ft^2$  deg F. The moisture contents were less than 1%. The relative flammability of all mineral fiber insulations was non-burning, exclusive of paper backings. A microscopic examination showed no anomalies. The results are given in Tables 8.10 and 8.14.

# 9.4.2 Ceiling Applied Mineral Fiber Insulations

Thirty-two samples of ceiling applied mineral fiber insulations were removed, twenty-eight were glass fiber and four were rock/slag wool. Four of the glass fiber were batts. The ages varied from 2 months to 14 years with one unknown and an average age of 2.7 years. The densities varied from 0.65 to 6.7 lbs ft-3 and the thermal resistance from 2.35 to 4.25 Btu-1 h ft2 deg F. The average density was 2.4 lbs ft-3 and the average thermal resistance was 3.4 Btu-1 h ft2 deg F. The moisture contents were less than 1%. The relative flammability of all mineral fiber insulations was non-burning, exclusive of paper backings. A microscopic examination showed no anomalies. The results are shown in Tables 8.12 and 8.16 and 8.18.

### 9.4.3 Conclusions

The relation between the density and thermal resistance of the mineral fiber insulations varied substantially. No reference curve fit could be made because of the variability.

The moisture content was negligible.

#### 9.5 ATTIC VENTILATION

#### 9.5.1 Findings

HUD Minimum Property Standards require one square foot of attic ventilation for each 150 square feet of ceiling space when no ceiling vapor barrier is installed, and one square foot per 300 square feet of ceiling space when a one perm vapor barrier is installed on the warm side of the ceiling. Further, this ventilation should be divided equally between the upper portion of the space and the eave or cornice vents. Generally, the venting installed in the test attics was less than as recommended. Few signs of moisture accumulation or structural deterioration due to moisture were observed.

A visual inspection of the free area of attic vents related to the total area of insulated ceiling indicated that approximately 1/3 of the mineral fiber retrofitted attics and nearly all of the cellulose retrofitted attics were ventilated below the recommendations of the HUD Minimum Property Standards. A careful inspection of the sheathing nail tips for corrosion and roof boards for staining revealed little evidence of past moisture accumulation that might be attributable to excessive winter moisture build-up in these minimally ventilated attics. One owner reported moisture accumulation during one winter season which had since been corrected by the addition of roof vents. No signs of staining were observed in that attic. Stop boards in the eaves of another attic showed signs of deterioration due to the improper installation of roof rafter insulation. This insulation had been removed:

#### 9.5.2 Conclusions

The observations of reinsulated attics were made during the summer months, and actual moisture accumulation was not present. The effects of winter moisture accumulation evidenced by staining and rusting may not be evidenced for several winter seasons, especially where the dewpoint is reached within the insulation. Additionally, minimal ventilation frequently occurred in older homes with presumably higher outside air infiltration rates in the living space, resulting in lower relative humidities. A better evaluation of moisture effects in minimally ventilated attics can be made during the winter months, when temperature and vapor pressure conditions are most conducive to condensation.

#### 9.6 VAPOR BARRIERS

## 9.6.1 Findings

Fourteen walls (64%) and 19 ceilings (40%) in the sample had no vapor barrier. The remaining walls and ceilings were fitted with vapor barriers of treated paper, building felts, foil, polyethylene or shingles. Two wall vapor barriers were located on the inhabited side of the cavity, one in the middle of the cavity, and five on the outside of the cavity. Twenty-seven ceiling vapor barriers were located on the inhabited side of the insulation and two were located in the middle of the insulation.

A visual inspection of the sample area revealed no signs of moisture accumulation or structural degradation in any of the above cases.

#### 9.6.2 Conclusions

As in the case of attics, vapor barriers were observed during the summer months and actual moisture accumulation was not present. Better evaluation of the effects of vapor barrier types and locations can be made during the winter months for reasons similar to those outlined under "Attic Ventilation".

#### 9.7 CONDITION OF STRUCTURE AND WIRING

## 9.7.1 Findings

Every sample area was observed for deterioration of structural and wiring components. Any observed degradation of wall structure could be directly attributable to through-wall water leakage. The single observation of structural degradation in a ceiling was caused by improper owner-installed rafter insulation which had since been removed.

Electrical components observed included flexible metal conduit, ceiling back-boxes behind surface mounted lights, and tube and post wiring. No evidence of degradation of any of these components due to the retrofit insulation was observed.

## 9.7.2 Conclusion

The materials in this sample did not noticeably affect the structure or wiring of the observed homes.

#### 9.8 CONTRACT PERFORMANCE

#### 9.8.1 Findings

Fifteen of the retrofits observed had an indication of level of performance. In most instances this was done by the contractor affixing a label to a roof rafter in the attic area; in the other cases, the performance was stated in contract form. Two contracts stated levels of performance by "R" factor, the remaining 13 contracts or labels stated performance only in terms of inches of material. Five of the installations were below stated performance levels and ten installations exceeded performance levels. On the average, the contractors exceeded their stated performance levels by 11 percent. Settling of loose fill material or variations in installation density could account for the majority of the work found to be less than labelled. Contract performance data is contained in Table 9.8.

#### 9.9 RETROFIT PROBLEMS

## 9.9.1 Findings

No particular ceiling retrofit problems were observed. Problems were encountered in the installation of every type of wall retrofit material. These problems ranged from a total lack of insulation in the wall cavity to a partial void within the insulation. There was no particular correlation between structural barriers within the cavities (such as convection barriers, fire stops, odd framing, etc.) and problems of installation; in approximately 25% of the installations there were no structural barriers and no retrofit problems; in another 25% of the cases, there were installation problems with no structural barriers and in the remaining cases there were structural barriers and no installation problems.

Significant problems were observed in four cases. In two cases, existing insulation within the wall cavity precluded the addition of significant amounts of retrofit insulations; in two other cases little or no insulation had been installed in the wall area opened. Evidence of attempts to install retrofit insulation was present in all cases.

## 9.9.2 Conclusions

Because of the methods of taking the sample (approximately four square feet of the entire wall area) no conclusions as to the overall installation can be drawn. Problems were observed in less than 15% of all observations and no out right attempts at fraud or misrepresentation on the part of the contractor were evident.

### 9.10 SETTLING

## 9.10.1 Finding

No determination of settling in walls or ceilings was determined. In walls, openings were made near grade level, and no noticeable difference in density was observed between the top and the bottom of the opening. In ceilings, the installed thickness of the retrofit insulation was usually not known. The measured depth of retrofit insulation in those ceilings labelled for installed thickness exceeded the original stated depth in nine cases while measuring less than the stated depth four times.

## 9.10.2 Conclusions

More extensive evaluation of the installation of the retrofit insulations and the potential for settling - particularly in loose fill insulations - should be made. This can be economically accomplished through the use of thermography. Representative areas of voids or settling should then be opened for further observation and testing.

TABL	E 9.8	С	CONTRACT PERFORMANCE	····						
Sample Number	Retro Age	Material	Retrofit Label	Measured Retrofit Thickness	Measured Total "R" Insulation	Measured "R" per inch Insulation	Density			
19C	3	GF	6"	6.50"	20 +	3.05	2.40			
20C	3	GF	6" reblow	7.50"	23 +	3.05	2.10			
21C	2.2	С	R-22	10.13"	34 +	3.40	1,80			
22C.	14	GF	10"	7.35	22 -	3.05	3.40			
35C	2	GF	19 bags 1232 s.f. 6" reblow	7.75	23 +	3.00	2.35			
37 <b>C</b>	2	GF	15 bags 988 s.f. 6" reblow	10.00	30 +	2.95	1.40			
43C	3.5	GF	6" reblow	9.25	30 +	3.25	1.70			
45C	3.2	GF	6" reblow	4.30	16 -	3.70	2.40			
46C	2	GF	8" reblow	8.50	28 +	3.25	1.40			
47C	3	GF	6" reblown glass fiber	6.50	22 +	3.45	2.30			
48C	3	GF	6" additional	6.75	21 +	3.15	1.60			
50C	3	GF	6" blown glass fiber	5.50	20 -	3.70	2.95			
53C	3.3	<b>G</b> F	6" reblow	5.50	19 -	3.45	3.55			
54C	3	GF	6"	8.00	27 +	3.35	2.35			
55C	2.5	С	40 bags 1000 s.f. R-24	5.25	17 -	3.25	3.80			
VOTES:	GF	= .G1		Material GF = Glass Fiber						

C = Cellulose

## 10. REFERENCES

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- 5. ASTM C421, 1971 Volume 18, "Mechanical Stability of Pre-formed Thermal Insulation by Tumbling".
- 6. ASTM C518, 1976 Volume 18, "Steady-State Thermal Transmission Properties by Means of a Heat Flow Meter".
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# 11. APPENDIX I - FIELD WORKSHEETS

Sample		
Number	Wall	Ceiling
1	X	X
2	<u>X</u> .	
3	X	
4	X	
5	X	
6	X	
7	X	
2 3 4 5 6 7 8 9	X	X
9	X X X X X X X X X X X X X X X X X X X	X X X
_10	X	X
10	X	X
12	X	X
13	X	X
13 14		X
15	X	a.X
		b.X
16	X	X
17	X	X
18	X	X
19		X
20		X
21 22 23		b.X X X X X X X
22		X
23	X	X
24		X
25	X	X
26	X X X	X X X X
24 25 26 27	X	X

Sample Number	Wall	Ceiling
		Ü
28		X
29 30		X
_30		X
31		X X X X
32 33		X
33		X
34		X
35 36		X
36		X
37 38	-	X
38	X	X
39		X
40	X	
41	X	
42		X
43		X X X
44		X
45		X
46		X
47		X
48	· · · · · · · · · · · · · · · · · · ·	X
49		X
_50		X
51		X
52		X
53		X
54		X
55		X

NAMEADDRESSPHONF	SAMPLE NO. 1 WALL DATE 9 June, 1977 SOURCE OF LEAD volunteer
GENERAL  AGE: retrofit ½ yr. house 42 ORIENTAT  HEAT SYSTEM gas H.W. INSTALLER & DATE	
framing type 2 X 4 stud condition of wiring N/A  ORIGINAL: insulation type rock wool vapo RETROFIT: insulation type UF vapo retrofit installation procedures/problems stucco l	house
	ingus
fIELD TESTS insulation thickness 3½" flame cha	r/no burn
SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insula insulation thickness(es), vapor barrier(s), ceiling gables, stops & firebreaks, ventilation, wiring, pa procedures, general notes)	materials, flooring,
rockwood batt	
foam	
lath & plaster	3/16" 3/48"
SECTION	# 13 13/16" ELEVATION
SHRINKAGE = 4%	

NAMEADDRESSPHONE		SAMPLE NO. 1 CEILING DATE 9 June, 1977 SOURCE OF LEAD volunteeer
GENERAL		
AGE: retrofit ½ yr. HEAT SYSTEM gas H.W.	house 42 ORIEN INSTALLER & D	OATE Nov. 1976
FIELD OBSERVATIONS		nocked out 2 windows - roof
plan location(s) <u>bedro</u> framing type <u>joist/raft</u> condition of wiring N	er co	enting vents to be installed ondition of structure good
ORIGINAL: insulation t RETROFIT: insulation t retrofit installation p	cype none v cype cellulose v	rapor barrier type none rapor barrier type none or boards
difficulty of opening/c	closing sample floor bo	ards
NONE	corrosion, odor, vermin,	
packing ok REPLACEMENT: insulation	friability Non fiberglass batt vapor b	
FIELD TESTS insulation thickness	4 5/8" flame	N/A
gables, stops & firebre procedures, general not		paint, installation
	15'	
	252277	
54"		
5*4*]		
54"		

NAME	SAMPLE NO. 2 WALL
ADDRESS	DATE 9 June, 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	
GENERAL  AGE: retrofit 2 yrs house 80 ORIEN	TATION north
	A (DTC
HEAT SYSTEM changed from gas to INSTALLER & DA	March 1975
FIELD OBSERVATIONS	
	nting N/A
framing type 2 X 4 stud - balloon com	ndition of structure good
condition of wiring N/A	
	apor barrier type none
	apor barrier type <u>none</u> blow hole - plaster droppings
in cavity	prom note - braster grobbings
difficulty of opening/closing sample none	
, , , , , , , , , , , , , , , , , , , ,	
PRESENCE OF: moisture, corrosion, odor, vermin,	fungus
cellulose slightly damp	
packing good friability N/A	
REPLACEMENT: insulation <u>fiberglass batt</u> vapor ba	arrier <u>none</u>
FIELD TESTS	
	chars, does not burn
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing insu	
insulation thickness(es), vapor barrier(s), ceili	
gables, stops & firebreaks, ventilation, wiring, procedures, general notes)	paint, installation
procedures, general noces,	
NOTE: packed tight at bottom, swelling at top	
NOTE: packed right at bottom, swerring at top	
wood siding	<b>1</b>
(XXI/A) → (XXI/A)	
building paper	
wood sheathing	
cellulose insulation	
N/A N:	384"
lath & plaster	307
	<del>                                     </del>
SECTION	
SECTION SECTION	
	14 3/8">
	ELEVATION

NAME	SAMPLE NO. 3 WALL
ADDRESSPHONE	DATE 9 June, 1977 SOURCE OF LEAD NSP
I HOND	SOURCE OF BEAD NSP
GENERAL	OD Y TO Y TO Y Y
AGE: retrofit house 27 HEAT SYSTEM F.A. INS	ORIENTATION north STALLER & DATE unknown
FIELD OBSERVATIONS	
plan location(s) bedroom	venting N/A
framing type 2 X 4 stud condition of wiring good	condition of structure excellent
ORIGINAL: insulation type wood fibre	batt vapor barrier type paper
RETROFIT: insulation type fiberglass	vapor barrier type N/A
retrofit installation procedures/probl	ems did not fill corner
difficulty of opening/closing sample_	none
PRESENCE OF: moisture, corrosion, odo	r, vermin, fungus
packing excellent fria	bility N/A
REPLACEMENT: insulation fiberglass bat	t vapor barrier <u>original left intact</u>
FIELD TESTS	
insulation thickness 2.97" average	flame chars, especially batt
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, ex	
insulation thickness(es), vapor barrie	
gables, stops & firebreaks, ventilation procedures, general notes)	n, wiring, paint, installation
wood siding	
WI/A Z	
	2.83
	2.85
	2.88
black paper	3.09
	3.37
	34
	2.89
	3.0
	14 1/8 - 7 3/16-
SECTION	ELEVATION

NAME	SAMPLE NO. 4 WALL
ADDRESS	DATE 9 June, 1977 SOURCE OF LEAD VOL.
PHONE	SOURCE OF LEAD VOC.
GENERAL	
AGE: retrofit 2 yrs house 71 ORIENTA	TOTAL
HEAT SYSTEM N/A INSTALLER & DA'	TE 1975
FIELD OBSERVATIONS	
	ting N/A
framing type balloon condition of wiring N/A	dition of structure good
	por barrier type NONE
RETROFIT: insulation type <u>foam</u> va	por barrier type <u>NONE</u>
	not in all cavities - cavities not
filled due to location of building paper difficulty of opening/closing sample none	
PRESENCE OF: moisture, corrosion, odor, vermin,	fungus
none packing N/A friability N/A	
	rriernone
DIAM D MDOMO	
FIELD TESTS  insulation thickness none flame N	/Δ
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing insuling insulation thickness(es), vapor barrier(s), ceiling	
gables, stops & firebreaks, ventilation, wiring, p	
procedures, general notes)	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
wood siding	
building paper—	
wood sheathing	
void	
building paper	
foam (uneven)	
void (varies)	
lath & plaster RI	EVATION
SECTION	
┃│	
void (varies)	
foam (uneven)	W W
building paper	
void — Void	V
wood sheathing PLAN	
building paper	

NAME	SAMPLE NO. 5 WALL
ADDRESS PHONE	DATE 10 June, 1977 SOURCE OF LEAD NSP
FHORE	BOOKGE OF EERD ROT
GENERAL .	
AGE: retrofit 3 yrs house 25 ORI HEAT SYSTEM H.W. INSTALLER &	ENTATION west DATE June 1974
HEAT STOTET H.W. INSTABLLA G	Julie 1974
FIELD OBSERVATIONS	
	venting N/A condition of structure good
condition of wiring N/A	condition of structure good
ORIGINAL: insulation type wood fiber batt	vapor barrier type poly
RETROFIT: insulation type styrene pellets	vapor barrier type none llets blown inside batt - compressed
retrofit installation procedures/problems pe batt. Did not fill cavity.	riets brown inside batt - compressed
difficulty of opening/closing sample none	
PDPGINOD OF	
PRESENCE OF: moisture, corrosion, odor, vermin	n, lungus
none packing N/A friability N	N/A
REPLACEMENT: insulation fiberglass vapor	barrier <u>original left intact</u>
FIELD TESTS	
insulation thickness N/A flame	N/A
CVERGUES (-1	
SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing in	nsulation, <b>new ins</b> ulation.
insulation thickness(es), vapor barrier(s), ce	iling materials, flooring,
gables, stops & firebreaks, ventilation, wiring	g, paint, installation
procedures, general notes)	
wood siding	* 1 9
1	H H H
building paper	
wood sheathing	<del></del>
cavity - All	
black paper	
wood fiber batt	
styrene chip	34 3/4
sheetrock	34,374
	J. J
<del>┃</del> ╟┈╎┈╎┈╎┈╎┈╎┈┤┈┼┈┼	
SECTION	conduit
<b> </b>	12 5/8
THE CONTROL OF THE CO	duit
The state of the s	

NAME	SAMPLE NO. 6 WALL
ADDRESS	DATE 23 June, 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	
AGE: retrofit 1.75 yr. house 60 (	est.) ORIENTATION north
	DYOMALIED C DAME
	INSTALLER & DATE August 1975
FIELD OBSERVATIONS	·
plan location(s) hall	venting N/A
framing type 2X4 studs	condition of structure excellent
condition of wiring N/A	
ORIGINAL: insulation type NONE	vapor barrier type bldg paper
RETROFIT: insulation type cellulo	oblems blown cellulose between plaster
lath & hldo paper - removed siding to	insert - 1 hole top & bottom of cavity
	multiple layers caused some difficulty -
	1½ hrs on site (½ due to checking ceiling)
PRESENCE OF: moisture, corrosion, o	
NONE	
	iability N/A
REPLACEMENT: insulation fiberglass	vapor.barrier_NONE
DIELD WEGWE	
FIELD TESTS insulation thickness 2.99" Avg.	flome
Insulation thickness 2.77 Avg.	flame char, does not support combustion
SKETCHES (elevation/plan/section)	
	existing insulation, new insulation,
insulation thickness(es), vapor barr	ier(s), ceiling materials, flooring,
gables, stops & firebreaks, ventilat	ion, wiring, paint, installation
procedures, general notes)	
BIN I H	┤ <del>╶╎┈╎┈╽┈╽┈╽┈╽┈╽┈╽╸</del> ┤┈╏
asbestos siding	2.65"
building paper	3.10"
lap siding (stains from tar paper)	3.00"
	2.55"
building paper	3.32"
wood board sheathing	++
, building paper on lath	2.62"
insulation	3.50"
lath & plaster	. 2.90"
3 5/8'	
	<b>†</b>
SECTION	17 3/84
	.
	PIEUMITON
	ELEVATION

HEAT SYSTEM F.A.

AGE: retrofit 2 vrs house 1959

NAME	SAMPLE NO.7 WALL
ADDRESS PHONE	DATE 5 July, 1977 SOURCE OF LEAD volunteer
GENERAL	

INSTALLER & DATE

ORIENTATION

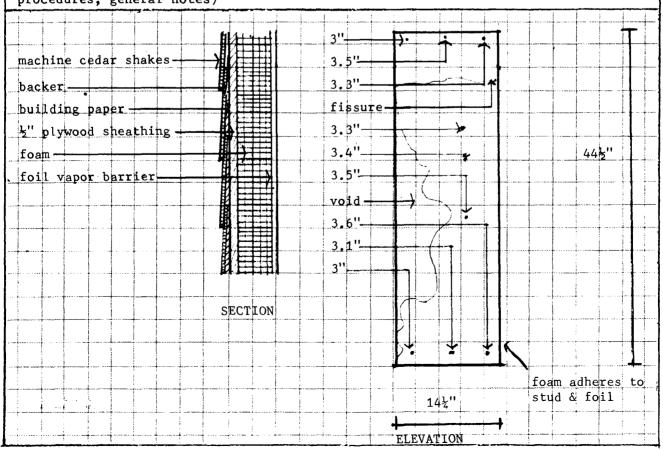
north

July, 1975

FIELD OBSERVATIONS	
plan location(s) bedroom	venting N/A
framing type 2x4	condition of structure excellent
condition of wiring N/A	
ORIGINAL: insulation type NONE	vapor barrier type foil
RETROFIT: insulation type U.F.	vapor barrier type N/A
retrofit installation procedures/problems 11	
cavity - did not fill cavity	
difficulty of opening/closing sample shingle	s fragile (1½ hours)
•	
PRESENCE OF: moisture, corrosion, odor, ver	min, fungus
NONE	
packing did not pack dowm V.B. friability	OK spongy-integral
	oor barrier left intact

FIELD TESTS
insulation thickness 3.3 average flame chars, does not support combustion

SKETCHES (elevation/plan/section)
(siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)



NAME	SAMPLE NO. 8 WALL
ADDRESS	DATE 13 July, 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	
	TION south-porch
HEAT SYSTEM F.A. INSTALLER & DATE	E unknown
FIELD OBSERVATIONS	
	ing N/A
	ition of structure excellent
condition of wiring N/A	
ORIGINAL: insulation type NONE vapo	or barrier type NONE
RETROFIT: insulation type cellulose vapo	or barrier type NONE
retrofit installation procedures/problems_stucco/f	framing @ door not filled
(no way to get to it)	
difficulty of opening/closing sample stucco over 1	ath 2 hrs
PRESENCE OF: moisture, corrosion, odor, vermin, fu	ingus
NONE	
packing good friability N/A	
REPLACEMENT: insulation fiberglass vapor barr	rier NONE
FIELD TESTS	
insulation thickness 3.27" flame char	rs
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing insula	
insulation thickness(es), vapor barrier(s), ceiling	
gables, stops & firebreaks, ventilation, wiring, pa	aint, installation
procedures, general notes)	
stucco on expanded	
metal lath	
3.3"-	
wood sheathing 3.4"_	
roll roofing	
cellulose 3 2"-	
plaster on wood lath sligh	tly loose -
3.2"-	445"
3.2"_	
3.38"	
3,30	1 1
┇┆╎┆┆┆┆┆┆┆	
<del>▊▗▎</del> ▃▎ <del>▗▕▗</del> ▗▎▃▎▄ <mark>▎▃</mark> ▍▃▍▄▍▄	
SECTION	+-+-+
	<del> </del>
<del>┠╎╶╎┈╎┈╎┈╎┈╎┈╎┈╎┈╎┈╎┈╏┈╏┈┪┉╽┉╽┈</del>	+
	ELEVATION
	<del></del>
	12"
	12"

	·	SAMPLE NO. 8	
ADDRESS PHONE		$ \begin{array}{cccc}  & DATE & \underline{13} \\  & SOURCE OF LEAI \end{array} $	July, 1977 NSP
		_	
GENERAL.	OD TEN	IMAMTON	
AGE: retrofit unknown h HEAT SYSTEM F.A.	OUSE 50 ORIEN LINSTALLER & I	NTATION N/A NATE unknown	
FIELD OBSERVATIONS			
plan location(s) <u>bedroom</u>		enting 4 9" vents	
framing type 6" joints 2x4 condition of wiring N/A		ondition of structure description desc	
ORIGINAL: insulation type		apor barrier type	
RETROFIT: insulation type			
retrofit installation proc	_	partial voids due	to filling &
subsequent removal of floo difficulty of opening/clos	ing sample 1 hour		
PRESENCE OF: moisture, co	rrosion, odor, vermin,	fungus	
NONE		<del>,</del>	
packing slightly loose REPLACEMENT: insulation	friability N/	A Parrier none	
FIELD TESTS insulation thickness 5"	flame	no char, no burn	
CVETCUEC / al analytica / al analytica /			
SKETCHES (elevation/plan/se (siding, sheathing, building)		ulation new insul	ation
insulation thickness(es),			
gables, stops & firebreaks			
procedures, general notes)	The state of the s		
<b>Sec. 1</b>		<del>                                     </del>	+
			<del>                                      </del>
to ridge vents			+
to ridge vents			***
to ridge vents open above knee wall			*
open above knee wall			*
open above knee wall			41"
open above knee wall stop vent			41"
open above knee wall stop vent			41"
open above knee wall stop vent			41"
open above knee wall stop vent			41"
open above knee wall stop vent			41"
open above knee wall stop vent insulation			41"
open above knee wall stop vent			41"
open above knee wall stop vent insulation			41"
open above knee wall stop vent insulation			41"
open above knee wall stop vent insulation		14 5/8"	41"
open above knee wall stop vent insulation		14 5/8"	41"
open above knee wall stop vent insulation		14 5/8"	

NAME		SAM	PLE NO			
ADDRESS		DAT			y <b>, 1</b> 97	7
PHONE		sour	RCE OF I	EAD	NSP	<del> </del>
					<del></del>	
GENERAL AGE: retrofit 2 hou	- 27	TENMAMION		-1-		
AGE: retrofit 2 house HEAT SYSTEM F.A	se <u>27</u> OI INSTALLER	RIENTATION	nor			
HEAT STOTEM F.A	INSTABLER	Q DATE		17.5		
FIELD OBSERVATIONS						
plan location(s) bedroom		venting	N/A			
framing type 2-4 stud		condition	of stru	cture	excel	lent
condition of wiring N/A						
ORIGINAL: insulation type	batt glass	_ vapor ba:	•			<del></del>
RETROFIT: insulation type n		vapor ba	-		,	
retrofit installation procedu	ures/problems	hø retrofit	at wind	low ro	ugh-in	
difficulty of opening/closing	a comple chinal	o fracila				
difficulty of opening/crosing	g sample sningle	es magne			<del></del>	
PRESENCE OF: moisture. corre	osion, odor, ver	nin, fungus				
NONE		,6				
packing good	friability	N/A				
REPLACEMENT: insulation fib	er glass vap	or barrier_	buildin	g pape	r	
FIELD TESTS	~1	- <b>1</b>	£1			····
insulation thickness 2.7"	flat	ne no chai	, no fl	ame		
SKETCHES (elevation/plan/sec	tion)					
(siding, sheathing, building		insulation	. new ir	sulat	ion.	
insulation thickness(es), va						
gables, stops & firebreaks,						
procedures, general notes)	•	· ·				
shingle		2.7"		+ +	1	
backer						
Dacker —		2.7'		#4	╌┼╂╂┼╌	
building paper		2.6"				
plywood sheathing		3"				
blown insulation		3.3"	17	+		
kraft paper		3.4"	15	<del>↓</del> }↓	<del></del>	
batt insulation	# <b>258</b>					
			1.	1	141	-       <del>-</del>
tar paper vapor barrier		2.3"		+•	<b>┼</b> ┇╂	443''
sheetrock	1	2.3"-		<b>┼</b> ┓.		
	SECTION	2.2"				
$\begin{bmatrix} + \bullet & + & + & + & + & + & + & + & + & +$		4.4	$-\Pi$	++-+-	-++ <b>- </b>  -	
	3.63"			44-4		_ <b>_</b>
$oxed{ egin{array}{cccccccccccccccccccccccccccccccccccc$		+		++		
				111	$\bot \downarrow \downarrow \downarrow \downarrow$	
			1+	+	14	
			-			-  <del> -</del>
				144"	1 1	
			1	142		
			+	142	-4	

NAMEADDRESS	SAMPLE NO. 9 CEILING DATE 13 July, 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	
AGE: retrofit 2 house 27 ORIE HEAT SYSTEM F.A. INSTALLER &	NTATION N/A DATE 1975
FIELD OBSERVATIONS	
plan location(s) bedroom von framing type joist & rafter co	enting 2-ridge 6"X8", very small gab ondition of structure excellent
condition of wiring appeared good	ondiction of structure executence
ORIGINAL: insulation type batt	vapor barrier type none
RETROFIT: insulation type blown glass retrofit installation procedures/problems NONE	vapor barrier type <u>none</u>
difficulty of opening/closing sample NONE	
PRESENCE OF: moisture, corrosion, odor, vermin	, fungus
NONE	
packing OK friability N REPLACEMENT: insulation fiber glass * vapor 1	
	Home
FIELD TESTS insulation thickness 5.4" flame	char, no burn
insuración chickness 3.4 frame	Char, no burn
insulation thickness(es), vapor barrier(s), ceil gables, stops & firebreaks, ventilation, wiring, procedures, general notes)	
retrofit insulation	5.25"
kraft paper	4.25"
original batt insulation—	6.25"
sheetrock ceiling —	5.25"
	5.75"
	45"
72	, h
SECTION	
** New aluminum trim installed over existing Severe icing last winter. New ridge vents	
Severe icing last winter. New ridge vents this spring.	
	14"
	1 1 1 1 1 1
	DI DI ADTON

NAME ADDRESS PHONE	SAMPLE NO. 10 WALL DATE 14 July, 1977 SOURCE OF LEAD_volunteer
GENERAL  AGE: retrofit 1 yr 2 moshouse 89 ORIENTAT HEAT SYSTEM H.W. INSTALLER & DATE	ION north Feb. 1976
condition of wiring OK - old ORIGINAL: insulation type NONE vapor	r barrier type NONE r barrier type NONE ing - voids not filled ugh lath 1½ ngus or on wood not bad
insulation thickness varies - 3.7" flame chars  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation thickness(es), vapor barrier(s), ceiling gables, stops & firebreaks, ventilation, wiring, parprocedures, general notes)	materials, flooring,
asbestos siding over // unkown material sheathing foam	4" **
	ELEVATION

ADDRESS		SAMPLE NO. 10 CEILING
-		DATE 14 July, 1977
PHONE		SOURCE OF LEAD volunteer
GENERAL		
AGE: retrofit 1yr	2mos house 89	ORIENTATION north
HEAT SYSTEM H.W	· INST.	ALLER & DATE Feb. 1976
FIELD OBSERVATIONS		A Jan MOVE
plan location(s)_		venting NONE
framing type raf		condition of structure good
condition of wirin		
ORIGINAL: insulat		vapor barrier type none
RETROFIT: insulation		vapor barrier type none ms scab boards - foam filled around
retrorit installa	tion procedures/problem	iis scan boards - roam fifted around
difficulturaf and	ning/closing sample 1	hrs - odd frame
arritenity of oper	iring/crosing sample 1	Z III O OGG TEMME
DDECENCE OF	sture, corrosion, odor	vermin fungus
	stare, correston, odor,	o Actuant angles
NONE packing N/A	frich	ility good
REPLACEMENT: inst		vapor barrier none
THE THEOREM THE	-1001 IVaiii	rapor parrier none
FIELD TESTS	•	
insulation thickne	ess 3.8"	flame chars, no burn
SKETCHES (elevation	on/plan/section)	
		sting insulation, new insulation,
		(s), ceiling materials, flooring,
		, wiring, paint, installation
procedures, genera		
· i · · · · · · · · · · · · · · · · · ·		
Lasein		
roofing		
roofing wood sheathing		3.9" 3/cp
wood sheathing		->
wood sheathing foam		3.8"
wood sheathing		3.8"
wood sheathing foam wood sheathing		3.8" ( cracy
wood sheathing foam		3.8"
wood sheathing foam wood sheathing		3.8" ( cracy
wood sheathing foam wood sheathing		3.8"
wood sheathing foam wood sheathing		3.8" 3.9" 3.7" 3.9" 40"
wood sheathing foam wood sheathing		3.8"
wood sheathing foam wood sheathing		3.8" 3.9" 3.7" 3.9" 40"
wood sheathing foam wood sheathing	SECTION	3.8" 3.9" 3.7" 3.9" 40"
wood sheathing foam wood sheathing	SECTION	3.8" 3.9" 3.7" 3.9" 40"
wood sheathing foam wood sheathing	SECTION	3.8" 3.9" 3.7" 3.9" 40"
wood sheathing foam wood sheathing	SECTION	3.8" 3.9" 3.7" 3.9" 40"
wood sheathing foam wood sheathing	SECTION	3.8"  3.9"  3.9"  3.9"  40"  3.8"
wood sheathing foam wood sheathing	SECTION	3.8"  3.9"  3.9"  3.9"  40"  3.8"
wood sheathing foam wood sheathing	SECTION	3.8" 3.9" 3.7" 3.9" 40"
wood sheathing foam wood sheathing	SECTION	3.8"  3.9"  3.9"  3.9"  40"  3.8"
wood sheathing— foam— wood sheathing— composition board-		3.8"  3.9"  3.9"  3.9"  3.8"  40"  3.8"
wood sheathing— wood sheathing— composition board-	SECTION	3.8"  3.9"  3.9"  3.9"  3.8"  40"  3.8"
wood sheathing— wood sheathing— composition board-		3.8"  3.9"  3.9"  3.9"  3.8"  40"  3.8"
wood sheathing— wood sheathing— composition board-		3.8"  3.9"  3.9"  3.9"  3.8"  40"  3.8"

GENERAL  AGE: retrofit 3 yrs house 50+ ORIENTATION south HEAT SYSTEM H.W. INSTALLER & DATE Aug. 1974  FIELD OBSERVATIONS plan location(s) kitchen venting NONE condition of wiring N/A CRIGINAL insulation type In none vapor barrier type none vapor barrier type none retrofit installation procedures/problems back plaster  difficulty of opening/closing sample cutting through lath & plaster  PRESENCE OF: moisture, corrosion, odor, vermin, fungus NONE packing N/A friability good REPIACEMENT: insulation UF vapor barrier none  FIELD TESTS  insulation thickness 1.88" flame chars, does not burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  Plaster wood lath company the packed of the	NAME ADDRESS PHONE	SAMPLE NO. 11 WALL DATE 14 July, 1977 SOURCE OF LEAD NSP
AGE: retrofit 3 yrs house 50+ ORIENTATION south HEAT SYSTEM H.W. INSTALLER & DATE Aug. 1974  FIELD OBSERVATIONS  plan location(s) kitchen venting NONE condition of structure excellent condition of wring N/A ORIGINAL: insulation type none vapor barrier type none retrofit insulation type UF vapor barrier type none retrofit insulation procedures/problems back plaster  difficulty of opening/closing sample cutting through lath & plaster  PRESENCE OF: moisture, corrosion, odor, vermin, fungus NONE acking N/A friability good REPLACEMENT: insulation UF vapor barrier none  FIELD TESTS insulation thickness 1.88" flame chars, does not burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  plaster wood lath company the procedures of the procedure of the proc	FHORE	SOUNCE OF ELAD NSP
FIELD OBSERVATIONS  plan location(s) kitchem		OD T DVD ( MTO)
plan location(s) kitchen	HEAT SYSTEM H.W. INSTALLE	
framing type2x4 back plaster		
condition of wiring N/A  ORIGINAL: insulation type UF vapor barrier type none  RETROFT: insulation type UF vapor barrier type none  retrofit installation procedures/problems back plaster  difficulty of opening/closing sample cutting through lath & plaster  PRESENCE OF: moisture, corrosion, odor, vermin, fungus  NONE NONE NAME OF Triability Good NEPLACEMENT: insulation UF vapor barrier none  FIELD TESTS  insulation thickness 1.88" flame chars, does not burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  plaster wood lath to back plaster wood lath stucce 2"  wood lath SECTION 1.5"  SECTION 1.5"  2"  "H-/be cannot be supported by the plant of the plant		
ORIGINAL: insulation type		condition of structure excellent
RETROFIT: insulation type UF vapor barrier type none retrofit installation procedures/problems back plaster  difficulty of opening/closing sample cutting through lath & plaster  PRESENCE OF: moisture, corrosion, odor, vermin, fungus  NONE PRESENCE OF: moisture, corrosion, odor, vermin, fungus NONE PRESENCE OF: moisture, corrosion, odor, vermin, fungus  NONE PRESENCE OF: moisture, corrosion, odor, vermin, fungus  NONE PRESENCE OF: moisture, corrosion, odor, vermin, fungus NONE PRESENCE OF: moisture, corrosion, odor, vermin, fungus NONE PRESENCE OF: moisture, corrosion, odor, vermin, fungus NONE PRESENCE OF: moisture, corrosion, odor, vermin, fungus NONE PRESENCE OF: moisture, corrosion, odor, vermin, fungus NONE PRESENCE OF: moisture, corrosion, odor, vermin, fungus NONE PRESENCE OF: moisture, corrosion, odor, vermin, fungus NONE PRESENCE OF: moisture, corrosion, odor, vermin, fungus NONE PRESENCE OF: moisture, corrosion, odor, vermin, fungus NONE PRESENCE OF: moisture, corrosion, odor, vermin, fungus NONE PRESENCE OF: moisture, corrosion, odor, vermin, fungus NONE PRESENCE OF: moisture, corrosion, odor, corrosion, odor, corrosion, odor, corrosion, odor, corrosion, odor, cor		vapor barrier type none
difficulty of opening/closing sample cutting through lath & plaster  PRESENCE OF: moisture, corrosion, odor, vermin, fungus  NONE packing N/A friability good REPLACEMENT: insulation UF vapor barrier none  FIELD TESTS Insulation thickness 1.88" flame chars, does not burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  plaster wood lath to back plaster wood lath stucco  section 1.5"  SECTION 1.5"  2"  1.6"  SECTION 1.5"		vapor barrier type <u>none</u>
PRESENCE OF: moisture, corrosion, odor, vermin, fungus  NONE packing N/A friability good REPLACEMENT: insulation UF vapor barrier none  FIELD TESTS insulation thickness 1.88" flame chars, does not burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  plaster wood lath charter wood lath stucco  SECTION 1.5"  SECTION 1.5"  SECTION 2"  "He - //B CEACCE."	retrofit installation procedures/problems	back plaster
NONE packing N/A friability good REPLACEMENT: insulation UF vapor barrier none  FIELD TESTS insulation thickness 1.88" flame chars, does not burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  plaster— wood lath foam— hack plaster— wood lath stucco  SECTION  1.5"—  SECTION  1.5"— 2"— 2"— 1.5"— 2"— 2"— 2"— 2"— 2"— 2"— 2"— 2"— 2"— 2	difficulty of opening/closing sample cut	ting through lath & plaster
packing N/A friability good REPLACEMENT: insulation UF vapor barrier none  FIELD TESTS insulation thickness 1.88" flame chars, does not burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  plaster wood lath foam back plaster wood lath stucco 2"	•	ermin, fungus
FIELD TESTS  insulation thickness 1.88"  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  plaster— wood lath stucco  SECTION  1.5"  SECTION  1.5"  2"  1.5"  1.6"  SECTION  1.5"		y good
SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  plaster————————————————————————————————————		
SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  plaster————————————————————————————————————	FIELD TESTS	
(siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  plaster—wood lath foam—back plaster—wood lath stucce—wood lath stucce—stuc		ame chars, does not burn
insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  plaster—wood lath foam—back plaster—wood lath stucco—  security  Section  1,5"—  2"—  1,6"—  2"—  2"—  2"—  2"—  2"—  2"—  2"—	SKETCHES (elevation/plan/section)	
gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  plaster— wood lath foam— back plaster— wood lath stucco  SECTION  1.5"— 2"— 2"— 2"— 2"— 2"— 2"— 2"— 2"— 2"— 2		
plaster— wood lath foam— back plaster wood lath stucco  SECTION  SECTION  District Control of the control of th		
plaster		iling, paint, installation
wood lath		
wood lath	plaster	2" 7
foam		2' 10"
back plaster	/:NX <del>11111</del> 13	10 18 18 18 18 18 18 18 18 18 18 18 18 18
wood lath		
		1 2010
SECTION 1.5"————————————————————————————————————	wood lath	
SECTION 1.6"————————————————————————————————————		
SECTION 1.6"————————————————————————————————————		
	STOTION	1.5"
	3401400	
		2" 4" 11
		*
	$oxed{ egin{array}{cccccccccccccccccccccccccccccccccccc$	
<del>▕</del> <del>▗</del> ╎ <del>╒</del> ┼╸┼╸┼╸┼╸┼╸┼╸┼╸┼╸┼╸┼╸┼╸┼		<del></del>
		FLEVATION

GENERAL  AGE: retrofit3 yrs house 50+ ORIENTATION south HEAT SYSTEM H.W. INSTALLER & DATE Aug. 1974  FIELD OBSERVATIONS  plan location(s) bathroom venting NONE (owner to do) framing type rafters & joist condition of structure excellent condition of wiring good (tube & post)  ORIGINAL: insulation type none vapor barrier type none RETROFIT: insulation type cellulose vapor barrier type none retrofit installation procedures/problems installation uneven - reported squirrels in attic difficulty of opening/closing sample much wood, plaster, debris in bottom of Cavity PRESENCE OF: moisture, corrosion, odor, vermin, fungus product dry - uneveness may be due to squirrels packing OK friability N/A REPLACEMENT: insulation fiberglass vapor barrier none  FIELD TESTS insulation thickness 5½" flame char, no burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  Insulation thickness below wrapped pipe  insulation below section
AGE: retrofit 3 yrs house 50+ ORIENTATION south HEAT SYSTEM H.W. INSTALLER & DATE 4ug. 1974  FIELD OBSERVATIONS  plan location(s) bathroom venting NONE (owner to do) framing type rafters & joist condition of wiring good (tube & post)  ORIGINAL: insulation type none vapor barrier type none retrofit insulation type cellulose vapor barrier type none squirrels in attic difficulty of opening/closing sample much wood, plaster, debris in bottom of cavity  PRESENCE OF: moisture, corrosion, odor, vermin, fungus product dry - uneveness may be due to squirrels packing OK friability N/A  REPLACEMENT: insulation fiberglass vapor barrier none  FIELD TESTS  Insulation thickness 5½" flame char, no burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  insulation tube & post wire below wrapped pipe
plan location(s) bathroom venting NONE (owner to do) framing type rafters & joist condition of structure excellent condition of wiring good (tube & post)  ORIGINAL: insulation type none vapor barrier type none retrofit installation procedures/problems installation uneven - reported squirrels in attic difficulty of opening/closing sample much wood, plaster, debris in bottom of cav'ty PRESENCE OF: moisture, corrosion, odor, vermin, fungus product dry - uneveness may be due to squirrels packing OK friability N/A REPLACEMENT: insulation fiberglass vapor barrier none  FIELD TESTS insulation thickness 5½" flame char, no burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  Lath & plaster below wrapped pipe  Lath & plaster below wrapped pipe  SECTION below wrapped pipe  SECTION below rapped pipe
plan location(s) bathroom venting NONE (owner to do) framing type rafters & joist condition of structure excellent condition of wiring good (tube & post)  ORIGINAL: insulation type none vapor barrier type none retrofit installation procedures/problems installation uneven - reported squirrels in attic difficulty of opening/closing sample much wood, plaster, debris in bottom of cav'ty PRESENCE OF: moisture, corrosion, odor, vermin, fungus product dry - uneveness may be due to squirrels packing OK friability N/A REPLACEMENT: insulation fiberglass vapor barrier none  FIELD TESTS insulation thickness 5½" flame char, no burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  Lath & plaster below wrapped pipe  Lath & plaster below wrapped pipe  SECTION below wrapped pipe  SECTION below rapped pipe
framing type rafters & joist condition of structure excellent condition of wiring good (tube & post)  ORIGINAL: insulation type none vapor barrier type none retrofit installation procedures/problems installation uneven - reported squirrels in attic difficulty of opening/closing sample much wood, plaster, debris in bottom of cavity  PRESENCE OF: moisture, corrosion, odor, vermin, fungus product dry - uneveness may be due to squirrels packing OK friability N/A  REPLACEMENT: insulation fiberglass vapor barrier none  FIELD TESTS  insulation thickness 5½" flame char, no burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  insulation thickness(es) vapor barrier(s), below wrapped pipe below wrapped pipe
RETROFIT: insulation type cellulose vapor barrier type none retrofit installation procedures/problems installation uneven - reported squirrels in attic difficulty of opening/closing sample much wood, plaster, debris in bottom of cavity PRESENCE OF: moisture, corrosion, odor, vermin, fungus product dry - uneveness may be due to squirrels packing OK friability N/A REPLACEMENT: insulation fiberglass vapor barrier none  FIELD TESTS  insulation thickness 5½" flame char, no burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  Insulation tube & post wire below wrapped pipe    lath & plaster   below
retrofit installation procedures/problems installation uneven - reported squirrels in attic difficulty of opening/closing sample much wood, plaster, debris in bottom of cavity  PRESENCE OF: moisture, corrosion, odor, vermin, fungus product dry - uneveness may be due to squirrels packing OK friability N/A  REPLACEMENT: insulation fiberglass vapor barrier none  FIELD TESTS  Insulation thickness 5½" flame char, no burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  insulation tube & post wire below below wrapped pipe lath & plaster ceiling pipe below wrapped pipe lath & pipe below wrapped pipe lath & pipe below below below below below below wrapped pipe lath & pipe below belo
squirrels in attic difficulty of opening/closing sample much wood, plaster, debris in bottom of cavity PRESENCE OF: moisture, corrosion, odor, vermin, fungus product dry - uneveness may be due to squirrels packing OK friability N/A  REPLACEMENT: insulation fiberglass vapor barrier none  FIELD TESTS insulation thickness 5½" flame char, no burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  insulation tube & post wire below  lath & plaster below  vrapped pipe  SECTION below  24½"
Cavity PRESENCE OF: moisture, corrosion, odor, vermin, fungus product dry - uneveness may be due to squirrels packing OK friability N/A REPLACEMENT: insulation fiberglass vapor barrier none  FIELD TESTS insulation thickness 5½" flame char, no burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  insulation tube & post wire below ceiling pipe below
packing OK friability N/A  REPLACEMENT: insulation fiberglass vapor barrier none  FIELD TESTS  insulation thickness 5½" flame char, no burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  insulation tube & post wire below rapped pipe below section below rapped pipe limited below 2442"
FIELD TESTS  insulation thickness 5½" flamechar, no burn  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  insulation tube & post wire below wrapped pipe  section below 24½"
insulation thickness 5½"  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  insulation  tube & post wire  lath & plaster  ceiling  pipe below  wrapped pipe  section  below  24½"
insulation thickness 5½"  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  insulation  tube & post wire  lath & plaster  ceiling  pipe below  wrapped pipe  section  below  24½"
(siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  insulation tube & post wire below wrapped pipe  SECTION below 2442"
lath & plaster  ceiling  pipe below  wrapped pipe  SECTION  below  24½''
wrapped pipe  SECTION below  24½"
SECTION below 24½"
ELEVATION
uneven job, one of the best cavities chosen
tube & post wiring found fairly good condition but exposed
+
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NAME	SAMPLE NO. 12 WALL
ADDRESS	DATE <u>26 July, 1977</u>
PHONE	SOURCE OF LEAD NSP
GENERAL	
GENERAL AGE: retrofit .75 yr house 95+ ORIENTA	ATION north
HEAT SYSTEM forced air INSTALLER & DAT	
HEAT STOTEM TOTAL THOUSANDER & DATE	OCC 1770
FIELD OBSERVATIONS	
<u> </u>	ting dryer vent
framing type 2X4 stud cond	dition of structure good
condition of wiring N/A	
	oor barrier type None
	por barrier type None
retrofit installation procedures/problems heavy	backplaster
difficulty of opening/closing sample multiple 'ay	vers - 2 hours
DDECENCE OF maintains and a second of	**************************************
PRESENCE OF: moisture, corrosion, odor, vermin, f recent rain - siding wet @ window edge, sheathing	
packing loose friability N/A	
	rier none
ADDITIONAL TRANSPORT OF THE PROPERTY OF THE PR	TOTAL MONE
FIELD TESTS	
insulation thickness 1½" flame c	char, no burn
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing insul	lation, new insulation,
insulation thickness(es), vapor barrier(s), ceilin	
gables, stops & firebreaks, ventilation, wiring, p	paint, installation
procedures, general notes)	<del></del>
lap siding	
heavy kraft-type	15
paper	
	<del></del>
sheath	41 3/4
1½ backplaster	
3/4sheath	
fiberglass	1.5
lath & plaster	
Tach & plaster Asia Asia Asia	
SECTION	15 1/8
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NAMEADDRESS	SAMPLE NO. 12 CEILING DATE 26 July. 1977
PHONE	SOURCE OF LEAD NSP
GENERAL ·	
AGE: retrofit .75 house 95 ORIENTA	ATION N/A
HEAT SYSTEM forced air INSTALLER & DAT	TE September 1976
FIELD OBSERVATIONS	
plan location(s) bedroom vent	ting 2 - 8X10 ridge - eave open
framing type rafter & joist condition of wiring good - tube & post	lition of structure good
ORIGINAL: insulation type mineral wool var	oor barrier type none
	oor barrier type none
retrofit installation procedures/problems none	
difficulty of opening/closing sample none	
PRESENCE OF: moisture, corrosion, odor, vermin, f	ungus
packing good friability N	I/A
REPLACEMENT: insulation fiberglass vapor bar	rier none
FIELD TESTS	
	r, no burn
SKETCHES (elevation/plan/section)	
ables, stops & firebreaks, ventilation, wiring, porocedures, general notes)	
	32h"
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143/8"	
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NAME	SAMPLE NO. 13 WALL
ADDRESS	DATE 26 July, 1977
PHONE	SOURCE OF LEAD volunteer
GENERAL	
	ION north
HEAT SYSTEM forced air INSTALLER & DATE	January 1976
FIELD OBSERVATIONS	
	ng N/A
	tion of structure excellent
condition of wiring N/A	
	r barrier type none
	r barrier type <u>none</u> l in cavity - tar barrier
installer used 2 entries per cavity per story	I In Cavity - tar parrier
difficulty of opening/closing sample none	
difficulty of opening, crosing sample none	
PRESENCE OF: moisture, corrosion, odor, vermin, fur	ngus
NONE	5
packing N/A friability good	
REPLACEMENT: insulation UF vapor barr	ier NONE
FIELD TESTS	
insulation thickness 3.27" flame cl	har/no burn
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing insular	
insulation thickness(es), vapor barrier(s), ceiling	
gables, stops & firebreaks, ventilation, wiring, par	int, installation
procedures, general notes)	
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BUG PAPER	
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wood GLEDTHING	
BLOG PARE ON NAILER	44.
INSULATION	184K 4K4
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LOTH PLOSTER	45
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NAME ADDRESS PHONE		SAMPLE NO. 1 DATE 2 SOURCE OF LEA	6 July, 1977
GENERAL  AGE: retrofit 1½  HEAT SYSTEM F.A.	house 75+ INSTALLE	ORIENTATION <u>N/A</u> ER & DATE Januar	y 1976
FIELD OBSERVATIONS  plan location(s) before framing type joist/rai		no eave - venting gable win condition of struct	no stops dow/ no ridge
condition of wiring ORIGINAL: insulation RETROFIT: insulation retrofit installation	N/A  type_rockwool  type_cellulose  procedures/problems_	vapor barrier type vapor barrier type floorboards	none
difficulty of opening  PRESENCE OF: moisture			
none packingmoderate REPLACEMENT: insulat	friabilit on <u>fiberglass ba</u> tt va		
FIELD TESTS insulation thickness	4.48" total fl	ame <u>char, no burn</u>	
insulation thickness(	uilding paper, existin es), vapor barrier(s), eaks, ventilation, wi	g insulation, new insu ceiling materials, fl ring, paint, installat	ooring,
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NAME	SAMPLE NO. 15 WALL
ADDRESS	DATE 27 July, 1977
PHONE	SOURCE OF LEAD volunteer
GENERAL	
AGE: retrofit 2 house 25	ORIENTATION porth
	TALLER & DATE Sept 1975
FIELD OBSERVATIONS	
plan location(s) bedroom	venting_N/A
framing type 2X4 stud condition of wiring N/A	condition of structure excellent
ORIGINAL: insulation type NONE	vapor barrier type foil on outside
RETROFIT: insulation type cellulose	vapor barrier type none
retrofit installation procedures/proble	
difficulty of opening/closing sample	NONE
DDECEMOR OF The state of the st	· · · · · · · · · · · · · · · · · · ·
PRESENCE OF: moisture, corrosion, odor none	., vermin, lungus
	oility N/A
	vapor barrier replaced foil
FIELD TESTS	
insulation thickness 3.2"	flame char - no hurn
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, exi	sting insulation new insulation.
insulation thickness(es), vapor barrier	
gables, stops & firebreaks, ventilation	
procedures, general notes)	
siding	
bldg paper	1
sheathing	
foil	
cellulose	46 3/4
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sheetrock	
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gab	ced 60	, s ure	top s,	s & gen	fi era	reb	rea ote	ks, s)	ve	nti					g, pa	int	, 11						1- <i>W</i>	•	
gab	ced 60	, s ure	top s,	s & gen	fi era	reb	rea ote	ks, s)	ve	nti					g, pa	int	, 11						1-1/2		
gab	ced 60	, s ure	top s,	s & gen	fi era	reb	rea ote	ks, s)	ve	nti					g, pa	int	, 11						1-1/ <sub>2</sub>		
gab	ced 60	, s ure	top s,	s & gen	fi era	reb	rea ote	ks, s)	ve	nti					g, pa	int	, 11						1- <i>h</i> ,	<b>3</b>	
gab	ced 60	, s ure	top s,	s & gen	fi era	reb	rea ote	ks, s)	ve	nti					g, pa	int	, 11						1-1/ <sub>2</sub>	<b>3</b>	
gab	ced 60	, s ure	top s,	s & gen	fi era	reb	rea ote	ks, s)	ve	nti					g, pa	int	, 11						41/2	<b>*</b>	
gab	ced 60	, s ure	top s,	s & gen	fi era	reb	rea ote	ks, s)	ve	nti	lati	on,	wir	ing	g, pa	int	, 11						41/2	<b>3</b>	
gab	ced 60	, s ure	top s,	s & gen	fi era	reb	rea ote	ks, s)	ve	nti	lati	on,		ing	g, pa	int	, 11						41/2	<b>3</b>	
gab	ced 60	, s ure	top s,	s & gen	fi era	reb	rea ote	ks, s)	ve	nti	lati	on,	wir	ing	g, pa	int	, 11						41/2	<b>3</b>	
gab	ced 60	, s ure	top s,	s & gen	fi era	reb	rea ote	ks, s)	ve	nti	lati	on,	wir	ing	g, pa	int	, 11						41/2	<b>3</b>	
gab	ced 60	, s ure	top s,	s & gen	fi era	reb	rea ote	ks, s)	ve	nti	lati	on,	wir	ing	g, pa	int	, 11						1-1/ <sub>2</sub>	<b>3</b>	
gab	ced 60	, s ure	top s,	s & gen	fi era	reb	rea ote	ks, s)	ve	nti	lati	on,	wir	ing	g, pa	22'	, 11						41/2	<b>3</b>	
gab	ced 60	, s ure	top s,	s & gen	fi era	reb	rea ote	ks, s)	ve	nti	lati	on,	wir	ing	g, pa	int	, 11						4 <i>1</i> / <sub>2</sub>	<b>3</b>	
gab	ced 60	, s ure	top s,	s & gen	fi era	reb	rea ote	ks, s)	ve	nti	lati	on,	wir	ing	g, pa	22'	, 11						4 <i>1</i> / <sub>2</sub>	<b>3</b>	
gab	ced 60	, s ure	top s,	s & gen	fi era	reb	rea ote	ks, s)	ve	nti	lati	on,	wir	ing	g, pa	22'	, 11						41/2	<b>3</b>	

NAME	SAMPLE NO. 15 b CEILING
ADDRESS	DATE 27 July, 1977
PHONE	SOURCE OF LEAD volunteer
CENEDAL	
GENERAL AGE: retrofit 2 house 6 (addition)ORIENTA	ATTON 110
HEAT SYSTEM forced air INSTALLER & DAT	
HEAT OTOTAL TOTAL AND	001, 1975
FIELD OBSERVATIONS	
plan location(s) family room vent	ting 1 gable open to main attic
	dition of structure excellent
condition of wiring N/A	
	por barrier type poly
	por barrier type <u>N/A</u>
retrofit installation procedures/problems tight sp	Dace
difficulty of opening/closing sample tight space	- 2 hours total
difficulty of opening/crosing sample tight space	- 2 nours total
PRESENCE OF: moisture, corrosion, odor, vermin, f	fungus
NONE	<del>U</del>
	I/A
REPLACEMENT: insulation fiberglass batt vapor bar	rrier left original intact
FIELD TESTS	
insulation thickness 7½" flame ch	nar, no burn
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing insul	lation, new insulation.
insulation thickness(es), vapor barrier(s), ceilin	
gables, stops & firebreaks, ventilation, wiring, p	
procedures, general notes)	
1	
	H 3/2"
	770
<del>╒┊╸</del> ┼┈┼┈┼┈┼┈┼┈┼┈┼┈┼┈┼┈ <del>┞╸╎╍┼╍┼╸┼╍┼╸</del>	

NAME	SAMPLE NO. 16 WALL
ADDRESS	DATE <u>27 July</u> 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	
AGE: retrofit ½ yr house 100	
HEAT SYSTEM F.A. INST.	ALLER & DATE Spring 1977
FIELD OBSERVATIONS	
plan location(s) storage room	venting N/A
framing type 2X4 stud	condition of structure excellent
condition of wiring N/A ORIGINAL: insulation type NONE	1
ORIGINAL: insulation type NONE RETROFIT: insulation type blown glass	vapor barrier type red rosin bldg.
retrofit installation procedures/problem	
retrolit installation procedures/problem	ms rirestop
difficulty of opening/closing sample s	siding fragile - shoothing blindneiled
difficulty of opening/closing sample s	siding fragile - sheathing billionailed
PRESENCE OF: moisture, corrosion, odor,	vermin fungus
NONE	, verming runguo
packing medium-not dense friab	ility N/A
REPLACEMENT: insulation fiberglass batt	vapor barrier re-installed owner's orig.
TIPETETADD DALL	re-mstarren owner s orig.
FIELD TESTS	
insulation thickness full cavity	flame char, no burn
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, exist	sting insulation, new insulation,
insulation thickness(es), vapor barrier(	
gables, stops & firebreaks, ventilation,	
procedures, general notes)	
siding	, <u>*</u> T
	4.3-1-1
poly (by owner)	sample bellies
	04t     17 3/4
red	3,3,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4,4
rosin paper	after hand
sheathing	packing
	Packing A
fiberglass ins.	
5/8" wood	
paneling	
panerrug	17
	1 21½>
	ELEVATION
7/8'	
3 3/4	<del>}</del>
3 374	
SECTION	

	SAMPLE NO. 16 CEILING
ADDRESS	DATE 27 July, 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	
	TTON
HEAT SYSTEM F.A. INSTALLER & DAT	Spring 1977
FIELD OBSERVATIONS	
plan location(s) bedroom vent	ing1 ridge 8X10, no soffit
	lition of structure excellent
condition of wiring N/A	ittion of structure excertenc
	oor barrier type <u>paper</u>
RETROFIT: insulation type blown glass vap	oor barrier type N/A
retrofit installation procedures/problems numerous	is trash in cavity, existing
batt uneven under floor	
difficulty of opening/closing sample floorboards	
difficulty of opening/closing sample 1100rboards	
PRESENCE OF: moisture, corrosion, odor, vermin, f	ungus
NONE	
packing uneven-very dense-v loose friability N/A	
REPLACEMENT: insulation fiberglass batt vapor bar	rier orig. re-installed
FIELD TESTS.	
insulation thickness see below flame	char, no burn
Thisuraction thickness see below Traile	char, no burn
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing insul	ation, new insulation,
insulation thickness(es), vapor barrier(s), ceilin	g materials. flooring.
gables, stops & firebreaks, ventilation, wiring, p	
	dine, installation
procedures general notes)	·
procedures, general notes)	
procedures, general notes)	
procedures, general notes)	Dy PART FILLED 7
	OT PART FILLED
	OT PART FILLED
	DY PART FILLED
	DY PART FILLED
voic	
voic	
14-1/2 3.35"	2.4" 41" 14
141/2 3.35" AUG. DEPTH	
14-1/2 3.35"	2.4" 41" 14 AVG. D. AVG. D. )
141/2 3.35" AUG. DEPTH	2.4" 41" 14
141/2 3.35" AUG. OEPTH REBION	2.4"   4.1"   14 ANG. D.   ANG. D.   PERLOW   PERLOW
141/2 3.35" AUG. OEPTH REBION	2.4"   4.1"   14 ANG. D.   ANG. D.   PERLOW   PERLOW
141/2 3.35" AUG. DEPTH	2.4" 41" 14 AVG. D. AVG. D. )
141/2 3.35" AUG. OEPTH REBION	2.4" 41" 14 ANG. D. ANG. D. PERLOW PERLOW
141/2 3.315" AUG. CEPTH REBION 211/4	2.4" 41" 14 ANG. D. ANG. D. PERLOW PERLOW
141/2 3.35" AUG. OEPTH REBION	2.4" 41" 14 ANG. D. ANG. D. PERLOW PERLOW
141/2 3.315" AUG. CEPTH REBION 211/4	2.4" 41" 14 ANG. D. ANG. D. PERLOW PERLOW
141/2 3.315" AUG. CEPTH REBION 211/4	2.4" 41" 14 ANG. D. ANG. D. PERLOW PERLOW
14/2 3.315" AUG. OEPTH PLAN	2.4" 41" 14 ANG. D. ANG. D. PERLOW PERLOW
HAVE 3.35"  AUG. DEPTH  PLEBION  PLAN  PLA	2.4" 41" 14 ANG. D. ANG. D. PERION REPLON  1 1 - 27/4
HAYZ 3.35" AUG. CEPTH PLEBLOW PLAN PLAN  VOICE  VOICE  VOICE  VOICE  VALIN  VAL	2.4"   4.1"   14 ANG. D.   ANG. D.   PERLOW   PERLOW
HAYZ 3.35"  AUG. OEPTH  PERION  PLAN  PLAN  TUBEL  TOTALED POPER DESCRIPTION  VOICE  VALUE  V	24" 41" 14 ANG. D. ANG. D. PERLOW PERLOW  1 1 - 27/4
HAVZ 3.35"  AUG. DEPTH  PLAN  PLAN  PLAN  PLAN  TABLED POPER  VALE  VALE	2.4" 41" 14 ANG. D. ANG. D. PERLOW PERLOW  165 14"
H4/2 3.35"  AUG. CEPTH REBION  211/4  PLAN  TARRED POREL  UARL  TURE  TARRED POREL  TARRED POREL  TARRED POREL  TARRED POREL  TARRED POREL  TARRED POREL	24" 41" 14 ANG. D. ANG. D. PERLOW PERLOW  1 1 - 27/4
H4/2 3.35"  AUG. CEPTH REBION  211/4  PLAN  TARRED POREL  UARL  TURE  TARRED POREL  TARRED POREL  TARRED POREL  TARRED POREL  TARRED POREL  TARRED POREL	2.4" 41" 14 ANG. D. ANG. D. PERLOW PERLOW  165 14"
HAVZ 3.35"  AUG. DEPTH  PLAN  PLAN  PLAN  PLAN  TABLED POPER  VALE  VALE	2.4" 41" 14 ANG. D. ANG. D. PERLOW PERLOW  165 14"
H4/2 3.35"  AUG. DEPTH REGION  PLAN  PLAN  TARILED POREL  VACUATION  LEP  1/2"	2.4" 41" 14 ANG. D. ANG. D. PERLOW PERLOW  165 14"
H4/2 3.35"  AUG. CEPTH REBION  211/4  PLAN  TARRED POREL  UARL  TURE  TARRED POREL  TARRED POREL  TARRED POREL  TARRED POREL  TARRED POREL  TARRED POREL	2.4" 41" 14 ANG. D. ANG. D. PERLOW PERLOW  165 14"
H4/2 3.35"  AUG. DEPTH REGION  PLAN  PLAN  TARILED POREL  VACUATION  LEP  1/2"	2.4"   41"   14 ANG. D.   ANG. D.   PERLOW   REPLOW

NAME ADDRESS PHONE	SAMPLE NO. 17 WALL  DATE 28 July, 1977  SOURCE OF LEAD NSP
GENERAL	
AGE: retrofit 4 house 1941 ORIENTA HEAT SYSTEM forced air INSTALLER & DAT	00000
FIELD OBSERVATIONS	
framing type 2X4 stud cond	ting N/A dition of structure excellent
condition of wiring N/A ORIGINAL: insulation type wood shavings var	por barrier type <u>NONE</u>
retrofit installation procedures/problems wood s	por barrier type <u>NONE</u> shavings fairly full in cavity -
did not allow fill.installation holes @ 7'6" and difficulty of opening/closing sample none	2'0"
PRESENCE OF: moisture, corrosion, odor, vermin, i	fungus
dampness lower right - outside bldg paper - rain pr packingwood shavings packed well friability good	]
REPLACEMENT: insulation_UF vapor bar	rrier_NONE
FIELD TESTS  insulation thickness full cavity flame fo	Dam chars, no burn - wood burns
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing insulation thickness(es), vapor barrier(s), ceiling	ng materials, flooring,
gables, stops & firebreaks, ventilation, wiring, procedures, general notes)	paint, installation
wood	
lap	145
building building building building building	7 7 7
tar Caulity	7. 8
paper 8-12	* + + + + + + + + + + + + + + + + + + +
sheathing	
sheathing	
celotex	
SECTION SECTION	35.34 Man 25.34 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.05
	ELEVATION

NAME ADDRESS PHONE	SAMPLE NO. 17 CEILING DATE 28 July, 1977 SOURCE OF LEAD NSP
GENERAL  AGE: retrofit 18 house 36 ORIENTA  HEAT SYSTEM F.A. INSTALLER & DAT	TION N/A
framing type joist/rafter cond condition of wiring N/A  ORIGINAL: insulation type wood shavings vap RETROFIT: insulation type Cellulose vap retrofit installation procedures/problems NONE  difficulty of opening/closing sample NONE  PRESENCE OF: moisture, corrosion, odor, vermin, f NONE  packing good friability N/A	open to attic with ing gable end - ridge vent lition of structure excellent or barrier type NONE or barrier type NONE
FIELD TESTS	r material chars, no burn
SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insul insulation thickness(es), vapor barrier(s), ceilin gables, stops & firebreaks, ventilation, wiring, p procedures, general notes)	g materials, flooring, aint, installation
	21/2"
	22'4"

NAME	SAMPLE NO. 18 WALL
ADDRESS	DATE 28 July, 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	
AGE: retrofit .66yr. house 56 yrs. ORIENTA	TION north
HEAT SYSTEM F.A. INSTALLER & DATI	
FIELD OBSERVATIONS	
plan location(s) bedroom vent	ing N/A
	ition of structure fair
condition of wiring N/A	
ORIGINAL: insulation type fiberglass batt vapo	or harrier type none
	or barrier type none
retrofit installation procedures/problems cavity	full - no retrofit could be
blown	rair - no recroire could be
difficulty of opening/closing sample none	
difficulty of opening/crosing sample none	
DEFCENCE OF mointure corrector of the first	unou o
PRESENCE OF: moisture, corrosion, odor, vermin, fu	nnkaa
cellutex sheathing rotting - (due to leakage)	
packing N/A friability N/A	
REPLACEMENT: insulation N/A vapor barr	rier <u>N/A</u>
ETELD MECHC	
FIELD TESTS	//
insulation thickness cavity full flame N	/A
CHEMOURO / 1 1 / 1 / 1 / 1	
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing insula	
insulation thickness(es), vapor barrier(s), ceiling	
gables, stops & firebreaks, ventilation, wiring, pa	aint, installation
procedures, general notes)	
MARIC NEXT IN THE TOTAL PROPERTY OF THE PROPER	
was signed	
BUS PARSE	
2 LAYERS CELOTEX S	SHEDTHING
ASSESSED OF THE PARTY OF THE PA	DY=\
( ROMING @ OUTER EI FICERGLASS BOTT ( I	NOT LETICOPIT)
NOW NOW ALL ONE	
WIND THE CEUCIEN	
building AXX	
paper AXXX X	
Substituting the substitution of the substitut	
SECTION	
320 ION	
* fiberglass was to be blown - no sample taken	
TANGETHES MES TO DE PLOMIT - ITO SAMPLE TAVEM	

NAMEADDRESSPHONE	SAMPLE NO. 18 CEILING  DATE 28 July, 1977  SOURCE OF LEAD NSP
GENERAL  AGE: retrofit .66 yr house 56 ORIENTA HEAT SYSTEM F.A. INSTALLER & DAT	TION N/A
framing type joist & rafter cond condition of wiring N/A .  ORIGINAL: insulation type 2 faced batt vap	ing gables - 1 roof complex ition of structure excellent open or barrier type tar paper - joint or barrier type NONE
difficulty of opening/closing sample NONE  PRESENCE OF: moisture, corrosion, odor, vermin, f NONE  packing good friability N/A  REPLACEMENT: insulation glass batt vapor bar	ungus rier_NONE
	th char, no burn
SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insul insulation thickness(es), vapor barrier(s), ceilin gables, stops & firebreaks, ventilation, wiring, p procedures, general notes)	g materials, flooring, aint, installation
ВОП — О О О О О О О О О О О О О О О О О О	H H H
EEGION)	36/2
	PAN

NAME ADDRESS PHONE	SAMPLE NO. 19 CEILING  DATE 5 August 1977  SOURCE OF LEAD NSP
GENERAL	
AGE: retrofit 3 yrs. house 25-30 ORIENTAT HEAT SYSTEM F.A. INSTALLER & DATE	
FIELD OBSERVATIONS	
plan location(s) <u>dining area</u> venti framing type <u>rafter &amp; joist</u> condi condition of wiring N/A	ng PRV + 2 10x10 gables tion of structure excellent
	or barrier type paper-discont. or barrier type N/A
difficulty of opening/closing sample none	
PRESENCE OF: moisture, corrosion, odor, vermin, fu	ingus
packing excellent friability N/A	ier original left intact
FIELD TESTS insulation thickness 9½ + flame c	har, no burn
SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insula insulation thickness(es), vapor barrier(s), ceiling gables, stops & firebreaks, ventilation, wiring, pa procedures, general notes)	materials, flooring,
	1434
67" RESLON (MINED GREY \$	Herrow 24"
THE PARTY DESCRIPTION OF THE PARTY DESCRIPTION	
ALER I	
SECTION	PLAN
NOTE: Label says 6" installed	
Eave vents appear blocked	
	•

	SAMPLE NO. 20 CEILING
ADDRESS	DATE <u>5 August 1977</u>
PHONE	SOURCE OF LEAD NSP
GENERAL	
AGE: retrofit 3.2 house 22 ORIENTA'	TION N/A
HEAT SYSTEM F.A. INSTALLER & DATE	
FIELD OBSERVATIONS	
	ing 2 gables *
framing type joist & rafter cond condition of wiring N/A	ition of structure excellent
	or barrier type paper- discont.
	or barrier type N/A
retrofit installation procedures/problems none	
11661	
difficulty of opening/closing sample none	
PRESENCE OF: moisture, corrosion, odor, vermin, fo	unous
none	
packing good friability N/A	
REPLACEMENT: insulation f glass batt vapor bar	rier <u>orig. left in place</u>
FIELD TESTS	
	ar, no burn
This traction children is a second se	ar, no purn
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing insula	
insulation thickness(es), vapor barrier(s), ceiling	
gables, stops & firebreaks, ventilation, wiring, pa	aint, installation
gables, stops & firebreaks, ventilation, wiring, pa procedures, general notes)	aint, installation
	aint, installation
	aint, installation
	aint, installation
procedures, general notes)	aint, installation
procedures, general notes)	aint, installation
procedures, general notes)	aint, installation  34
procedures, general notes)	34 - 1
procedures, general notes)	34 - 1
procedures, general notes)  17.5"  Rights GLASS	34 - 1
procedures, general notes)  17.5"  Recurs CLASS  Win. Wool	34 - 1
procedures, general notes)  17.5"  Plant GLASS  WIN. WOOL  LOSE- LAID	154
procedures, general notes)  17.5"  Rights GLASS  13'2"  Min. Wool	154
procedures, general notes)  17.5"  Plant CLASS  Win. WOOL  LOSE - (AID)	154
procedures, general notes)  17.5"  Plant Class  TREATED PLAN	154
procedures, general notes)  17.5"  Brown CLASS  Riwn CLASS  Whin. Wool  LOSE-LAID  TREAPED PLAN	154
procedures, general notes)  17.5"  Plant Class  Table 1000  Table	154
procedures, general notes)  17.5"  Brown CLASS  Riwn CLASS  Whin. Wool  LOSE-LAID  TREAPED PLAN	154
procedures, general notes)  17.5"  Brown CLASS  Riwn CLASS  Whin. Wool  LOSE-LAID  TREAPED PLAN	154
procedures, general notes)  # 7.5"  Pland CLASS    Win. Wool    LOSE - LAID   TREATED PERL    PLAN    NOTE: Label 4"    * gables 14"x36" less louvers	154
procedures, general notes)  ### 7.5"  Blown CLASS  #### 13/2"  win. Wool  LOSSE-LAIO  TREATED PLAN  NOTE: Label 4"	154
procedures, general notes)  # 7.5"  Pland CLASS  # 3'/2"  ### WIN. WOOL  LOSE - LAID  TREATED PARK  NOTE: Label 4"  * gables 14"x36" less louvers	154
procedures, general notes)  # 7.5"  Picum Class  # 3'/2"  ### WIN. WOOL  LOSE - LAID  TREATED APEL  PLAN  NOTE: Label 4"  * gables 14"x36" less louvers	154

NAME	SAMPLE NO. 21 CEILING
ADDRESS	DATE <u>5 August</u> 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	TON
AGE: retrofit 2 house 17 ORIENTAT	
HEAT SYSTEM F.A. INSTALLER & DATE	September 1975
FIELD OBSERVATIONS	
	ng 2 gable & 2 ridge *
framing type joist & rafter condi	tion of structure excellent
condition of wiring appears good	eton of structure exterient
ORIGINAL: insulation type foil faced batt vapo	or barrier type foil
	or barrier type none
retrofit installation procedures/problems tight spa	
difficulty of opening/closing sample tight space	
PRESENCE OF: moisture, corrosion, odor, vermin, fu	ngus
none	
packing good friability N/A	
REPLACEMENT: insulation fiberglass vapor barr	ier left original batt in place
FIELD TESTS	
insulation thickness 10.13" cellulose flame chars	s - self extinguishing
CVETCHES (alamatica (alam /alam /ala	
SKETCHES (elevation/plan/section)	bion inculation
(siding, sheathing, building paper, existing insula insulation thickness(es), vapor barrier(s), ceiling	materials flooring
gables, stops & firebreaks, ventilation, wiring, pa	
procedures, general notes)	int, installation
procedures, general moses,	
	+-22
┵┾╫╫╫	
1 1 1 1 A CELLULOSE	
VV/VV	
	H/2"
FOIL FACE	
EAST (=3/2")  KRAPT PAPER	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
VVVIII KRAPT PAPER.	
SECTION PLAN	
NOTE: Labeled R-22	
<del></del>	
* Gables 144 s.i. each less louvers	
and a second sec	
landa and a consideration of the contract of t	

NAME	SAMPLE NO.22 CEILING
ADDRESS	DATE 5 August, 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	
	NTATION N/A
HEAT SYSTEM electric F.A. INSTALLER & I	
	1900
FIELD OBSERVATIONS	
	enting 3 gable vents - see below
	ondition of structure excellent
condition of wiring N/A ORIGINAL: insulation type none v	vapor barrier typepoly
RETROFIT: insulation type blown	vapor barrier type <u>N/A</u>
retrofit installation procedures/problems none	
difficulty of opening/closing sample none	
DDECENCE OF	£
PRESENCE OF: moisture, corrosion, odor, vermin, none	, lungus
	N/A
	barrier original intact
FIELD TESTS	
insulation thickness 7.35" flame	char, no burn
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing ins	sulation, new insulation.
insulation thickness(es), vapor barrier(s), ceil	
gables, stops & firebreaks, ventilation, wiring,	
procedures, general notes)	
	21
	<del></del>
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	14'12."
1\ A/\ A \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	1472
W WOILER	
I POLT V.B.	
	Ludiusic
SECTION	CRIPPLE (244)
	PAN
NOTE: Original depth 10" - CONTRACT	
gable vents - 3 each 12 % 24	
soffit vents - 2" dia 22 each	

NAME	SAMPLE NO. 23 WALL
ADDRESS	DATE <u>17 August 1977</u>
PHONE	SOURCE OF LEAD volunteer
GENERAL OPTE	NYMA M T O V
	CNTATION North
HEAT SYSTEM gas H.W. INSTALLER &	DATE May '76
FIELD OBSERVATIONS	
	renting N/A
	condition of structure good
condition of wiring N/A	
ORIGINAL: insulation type none	vapor barrier type none
RETROFIT: insulation type cellulose	vapor barrier type none
retrofit installation procedures/problems barr	rier
difficulty of opening/closing sample asbestos	s shingles very difficult to
remove without damage	Funance
PRESENCE OF: moisture, corrosion, odor, vermin	, rangus
none packing_excellent friability_N/	/A
REPLACEMENT: insulation fiberglass vapor	
vapor	
FIELD TESTS	
insulation thickness 1.95 flame	N/A
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing in	
insulation thickness(es), vapor barrier(s), cei	
gables, stops & firebreaks, ventilation, wiring	g, paint, installation
procedures, general notes)	
	K 93/8x K- 143/8 x K- 12/8 x
SHOW ASESOS	
BINAX III SHINGLES	
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T LATH & PLASTER	
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	ME APRIL
SECTION	TYPICAL PLAN SECTION

ADDRESS							SAMPLE	NO. 23 (	CEILING	
					7 · 2/4		DATE	<u> 17 A</u>	ugust 19	
PHONE							SOURCE	OF LEAD_	volunte	er
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GENERAL		4 75	1			D T ENIMA MIT	.007	<del> </del>		
	etrofit_ STEM ga			ı <b>se</b> 6	5 CINSTALLER	RIENTATI	ON N/	<del> </del>		
DEAL SI	SIEM ga	is H.W.			INSTALLER	& DATE		Feb. 19	76	
FIFID O	BSERVATI	ONS				······································				
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ORIGINA	L: insu	lation	type_	none		vapor	barrie	r type_	none	
RETROFI'				cellul			barrie	r type_	none	
retrofi	t instal	lation	proced	lures/pr	oblems n	one				
31551			<del></del>			<del></del>				
difficu	lty of o	pening	Closit	ıg sampı	e big	log	<del> </del>			
PRESENC	F OF m	nistur	e corr	cosion	odor, ver	min fun	00118			
I KEUDENU.	none	.v.s.cul	,	.0510119	ouor, ver	اللا والما	.6u3			
packing				f	riability	N/A	<del></del>	<del> </del>	<del></del>	
REPLACE		nsulat	ion fih		batt var		er no	ne .		
FIELD T										
insulat	ion thic	kness_	6''		fla	me <u>cha</u> i	r, no bi	ırn		
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		fireb	reaks,							132/2
		fireb	reaks,							135/2
		fireb	reaks,							
		fireb	reaks,							135/2
		fireb	reaks,							13/2
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		fireb	reaks,							135/2

NAME	SAMPLE NO. 24 WALL
ADDRESS	DATE 17 August, 1977
PHONE	SOURCE OF LEAD volunteer
GENERAL	
AGE: retrofit 1.2 house 85	ORIENTATION north
HEAT SYSTEM gas H.W. INSTALL	ER & DATE July '76
FIELD OBSERVATIONS	
plan location(s) dining room	venting N/A
framing type 2X4 stud	condition of structure excellent
condition of wiring N/A	
ORIGINAL: insulation type none	vapor barrier type none
RETROFIT: insulation type UF	vapor barrier type none
retrofit installation procedures/problems	backplaster in certain areas
difficulty of opening/closing sample none	
difficulty of opening/closing sample	
PRESENCE OF: moisture, corrosion, odor, v	rormin fungue
none	ermin, rungus
	ty_good
REPLACEMENT: INSUIACION OF V	apor barrier none
FIELD TESTS	
	lame N/A
insulation thickness 3.4 1	lame N/A
SKETCHES (elevation/plan/section)	
	no insulation new insulation
(siding, sheathing, building paper, existi	
insulation thickness(es), vapor barrier(s)	
gables, stops & firebreaks, ventilation, w	iring, paint, installation
procedures, general notes)	
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	1-4/21 12
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NAME	SAMPLE NO. 24 CEILING
ADDRESS	DATE 17 August, 1977
PHONE	SOURCE OF LEAD volunteer
GENERAL ·	
AGE: retrofit 1.2 house 85 ORIENTAT	ION N/A
HEAT SYSTEM gas H.W. INSTALLER & DATE	
FIELD OBSERVATIONS	
plan location(s) living room venti	ng 3 ridge, 1 gable
framing type joist/rafter condiction of wiring good	tion of structure excellent
	r barrier type none
	r barrier type none
retrofit installation procedures/problems none	
21661-11-6-11-11-11-11-11-11-11-11-11-11-	
difficulty of opening/closing sample none	
PRESENCE OF: moisture, corrosion, odor, vermin, fu	nous
none	
packing N/A friability N/A	
REPLACEMENT: insulation fiberglass batt vapor barr	ier none
FIELD TESTS	
insulation thickness see below flame N/A	1
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing insula	
insulation thickness(es), vapor barrier(s), ceiling gables, stops & firebreaks, ventilation, wiring, pa	
procedures, general notes)	int, installation
8 BOTT	36
2'2' wax	IS"
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XXXXX I'N GRAN CORK	
NEWSPAPERS	
L &P PLAN	
BECTION	

NAME	SAMPLE NO. 25 WALL
ADDRESS	DATE <u>17 August 1977</u>
PHONE	SOURCE OF LEAD volunteer
CENEDAL	
GENERAL  AGE: retrofit 2.6 house 50 ORIE	ZNITA TITON
AGE: retrofit 2.6 house 50 ORIE HEAT SYSTEM gas H.W. INSTALLER &	ENTATION west
THEAT STOTEM gas n.w. INSTABLER OF	DATE Feb 5
FIELD OBSERVATIONS	
	venting N/A
framing type stud 2X4	condition of structure good
condition of wiring N/A	2000
	vapor barrier type none
	vapor barrier type none
retrofit installation procedures/problems nor	ne
difficulty of opening/closing sample difficult	to get through stucco
PRESENCE OF: moisture, corrosion, odor, vermin	
sheathing wet at corner due to downspout	
	rather friable
REPLACEMENT: insulation UF vapor	barrier none
PIDID TROTO	
FIELD TESTS insulation thickness 2.96 flame	N/A
insulation chickness 2,70 Illame	N/A
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing in	reulation new insulation
insulation thickness(es), vapor barrier(s), cei	
gables, stops & firebreaks, ventilation, wiring	
procedures, general notes)	g, parme, installation
procedures, general noces,	
	13'4" 14'/2"
	THE THE PARTY OF T
MET. LATH	
W SHIPHING	K 18 167 K 12 147 19/2
	47
INSULATIONS LOTH & PLASTER	
I LANGE OF VEDE	
1: VAHATE 1	
SECTION	
- SEGION	
* foam appeared to have different friability/de	ensity
inner sfc to outer sfq; some yellow discolora	ation on
exterior face near leakage corner.	

ADDRESS	SAMPLE NO. 25 CEILING
DUALE	DATE 17 August, 1977
PHONE	SOURCE OF LEAD volunteer
GENERAL	
	TATION N/A
HEAT SYSTEM gas H.W. INSTALLER & D	
FIELD OBSERVATIONS	small
plan location(s) bedroom ve	enting 1 gable very free area berf alur
framing type rafter/joist co	ondition of structure excellent
	rapor barrier type none
	apor barrier type none
retrofit installation procedures/problems none	e - attic hot - ventilation
minimal	
difficulty of opening/closing sample none	
PRESENCE OF: moisture, corrosion, odor, vermin,	funcus
some sign of moisture stain @ ridge - may be	old leakage
packing N/A friability	N/A
REPLACEMENT: insulation fiberglass batt vapor b	arrier none
	-
FIELD TESTS	
insulation thickness 6" flame_	N/A
SKETCHES (elevation/plan/section)	
gables, stops & firebreaks, ventilation, wiring,	
procedures, general notes)	paint, installation
	paint, installation
	paint, installation
	42"
	42"
	42"
	42"
	42"
	42"
	42"
	42"
	42"
procedures, general notes)	42"
	42"
procedures, general notes)	
procedures, general notes)	42"
procedures, general notes)	42"
procedures, general notes)	

NAME	SAMPLE NO. 26 WALL
ADDRESS	DATE 22 August 1977
PHONE	SOURCE OF LEAD VOL.
CONTRACT	
GENERAL	OD TENMAMION E
AGE: retrofit 1.5 house 7	
HEAT SYSTEM gas H.W.	INSTALLER & DATE March 1976
DIDI D. ODGEDIA MITONG	
FIELD OBSERVATIONS	37/4
plan location(s) bedroom	venting N/A
framing type 2X4 stud	condition of structure good
condition of wiring N/A	
ORIGINAL: insulation type no	
RETROFIT: insulation type UF	vapor barrier type none
retrofit installation procedures	s/problems backplaster
	ample aluminum siding, backplaster - several
layers - 2 hours	
PRESENCE OF: moisture, corrosic	on, odor, vermin, fungus
none	
packing N/A	friability outer layer friable, inner rather inte
REPLACEMENT: insulation UF	vapor barrier none
FIELD TESTS	
insulation thickness see below	flame char, no burn
SKETCHES (elevation/plan/section	
	per, existing insulation, new insulation,
	barrier(s), ceiling materials, flooring,
	tilation, wiring, paint, installation
procedures, general notes)	
	123/2" 1212" 123/2"
	1678 1 1678
FORM-BALLED	
METAL GIDING-18	1/2" ] '43/8" ] K-3/8"
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NO. SIGNAL	OUTER LATER SIDE
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WD SHEATH - HIS	14" 14" 14"
	4"   4"
PCOM - DAY	
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BALL WAS BILLIAM	1.7 d. 1/2'3 3/4"3
LATH	14-3/4 3/4 3/4-3/ K-3/4 3/4-3/ 1/2"
PLASTER	
	34" 5 1.4 d. 11.6"d
	17 7
Calendria 1	INNER LAYER ELEV.
Section	INNER LAYER ELEV.
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NAME	SAMPLE NO. 26 CEILING
ADDRESS	DATE 22 August, 1977
PHONE	SOURCE OF LEAD volunteer
	·
GENERAL	
AGE: retrofit $1\frac{1}{2}$ house	
HEAT SYSTEM gas H.W.	INSTALLER & DATE March 1976
DEBL D. ODGUDUARIONO	
FIELD OBSERVATIONS  plan location(s) entry	1 × 1/4
F	venting N/A
framing type rafter/joist	condition of structure good
condition of wiring N/A ORIGINAL: insulation type n	none vapor barrier type none
RETROFIT: insulation type c	
retrofit installation procedu	
loose floorboards	dies, problems dieveness - problem due Lo Blowny From
difficulty of opening/closing	g sample floorboards
dilitionity of opening, or or and	5 Sample IIIOIIDOAIUS
PRESENCE OF: moisture, corro	osion, odor, vermin, fungus
none	, ,
packing O.K.	friability N/A
REPLACEMENT: insulation cell	ulose vapor barrier none
FIELD TESTS	
insulation thickness 4.5"	flame chars, no burn
SKETCHES (elevation/plan/sect	
	paper, existing insulation, new insulation,
	por barrier(s), ceiling materials, flooring,
	ventilation, wiring, paint, installation
procedures, general notes)	
13/8-11	22/2-11-22/2
	256:
PLAN (TOT CAUIT	TY OEPTH 5/2")

	SAMPLE NO. 27 WALL
ADDRESS	DATE 22 August, 1977
PHONE	SOURCE OF LEAD volunteer
GENERAL	
AGE: retrofit 1 house 75+ OR	IENTATION N/A
HEAT SYSTEM gas H.W. INSTALLER	
Ras II	<u> </u>
FIELD OBSERVATIONS	
plan location(s) dining	venting N/A
framing type balloon - stops @ floor	condition of structure good
condition of wiring N/A	
ORIGINAL: insulation type none	vapor barrier type none
RETROFIT: insulation type cellulose	vapor barrier typenone
retrofit installation procedures/problems back	ackplaster
difficulty of opening/closing sample sawing	ng through lath and plaster
PRESENCE OF: moisture, corrosion, odor, verm	in, fungus
none	
packing excellent friability	N/A
	r barrier none
FIELD TESTS	
insulation thickness 2.2" flam	e chars, self extinguising
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing	insulation, new insulation.
insulation thickness(es), vapor barrier(s), c	
gables, stops & firebreaks, ventilation, wiri	
procedures, general notes)	ng, parne, installation
procedures, general notes,	
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	1-134-
	+134"+
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	1-134"-
1 - VINYL SIDING	1-134"-
7 L VIDAL SIDING  OUER ?  UDOO CHEDTHING	1-134"-
7 VINTE SIDING  OUER ?  TOUCH WOOD SHEATHING	+-134"-+
J. J	1-184-
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J. J	1-184
J. J	+-184"
7 VIDEL SIDING  OUER ?  OUED SHEATHING  OOID  BACKPLASTER  INSOLATION  LATH & PLASTER	+-1814*
7 VIDEL SIDING  OUER ?  OUED SHEATHING  OOID  BACKPLASTER  INSOLATION  LATH & PLASTER	49*
JANUAR SIDING  JUNER ?  JUNER ?  JUNER ?  JUNER ?  JUNER SIDING  JUNER ?  JUNER PLASTER  JUNER PLASTER  JUNER PLASTER	1-184-1
7 VIDEL SIDING  OUER ?  OUED SHEATHING  OOID  BACKPLASTER  INSOLATION  LATH & PLASTER	49*
J. J	49.
7 VIDEL SIDING  OUER ?  OUED SHEATHING  OOID  BACKPLASTER  INSOLATION  LATH & PLASTER	49.
JANUAR SIDING  JUNER ?  JUNER ?  JUNER ?  JUNER ?  JUNER SIDING  JUNER ?  JUNER PLASTER  JUNER PLASTER  JUNER PLASTER	49
7 VIDEL SIDING  OUER ?  OUED SHEATHING  OOID  BACKPLASTER  INSOLATION  LATH & PLASTER	49
JANUAR SIDING  JUNER ?  JUNER ?  JUNER ?  JUNER ?  JUNER SIDING  JUNER ?  JUNER PLASTER  JUNER PLASTER  JUNER PLASTER	49
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NAME	SAMPLE NO. 27 CEILING
ADDRESS	DATE 22 August, 1977
PHONE	SOURCE OF LEAD volunteer
GENERAL	
	5 + ORIENTATION N/A
HEAT SYSTEM gas H.W.	INSTALLER & DATE September 76
FIELD OBSERVATIONS	
plan location(s) hallway	venting 2 gables end + 18x24 each
framing type rafter/joist	condition of structure good
condition of wiring good	
ORIGINAL: insulation type mineral	
RETROFIT: insulation type cellulo	
retrofit installation procedures/p	roblems none
difficulty of opening/closing samp	le deep insulation - could not move around
attic - debris in bottom of car	vity
PRESENCE OF: moisture, corrosion,	odor, vermin, fungus
none	5-1-1114 N/A
<pre>packing excellent REPLACEMENT: insulation_fiberglass</pre>	friability N/A none
This is a second state of the second	2 vapor parrier Holle
FIELD TESTS	
insulation thickness see be	elow flame chars - self extinguishing
SKETCHES (elevation/plan/section)	, existing insulation, new insulation,
	rrier(s), ceiling materials, flooring,
gables, stops & firebreaks, ventil	
procedures, general notes)	
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CELLVIONE -	→//Y/Y/Y/X/X/X/);5.75"
BATT -	
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1 - 1 - 1 - 2 - 2 - 2	
LOTH & ROSTER -	SECTION STATES

N/A  N/A  1975  2, 9" ridge, 1  of structure_  rrier typen	PRV soffit ver excellent none none
N/A 1975  2, 9" ridge, 1 of structure_ rrier type n rrier type n none  no burn  new insulatierials, floori	PRV soffit ver excellent none none
none  no burn  new insulatierials, floori	excellent none none
none  no burn  new insulatierials, floori	excellent none none
none  no burn  new insulatierials, floori	excellent none none
2, 9" ridge, 1 of structure_ rrier type n rrier type n none  no burn , new insulatierials, floori	excellent none none
none no burn new insulatierials, floori	excellent none none
none no burn new insulatierials, floori	excellent none none
none no burn new insulatierials, floori	none none
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GENERAL  AGE: retrofit 1 house 54 ORIENTATION N/A  HEAT SYSTEM gas F.A. INSTALLER & DATE July '76  FIELD OBSERVATIONS  plan location(s) bedroom venting 2, 9" dia. roof vents per gall framing type loist & rafter condition of structure good condition of wiring N/A  ORIGINAL: insulation type none  RETROFIT: insulation type blown glass vapor barrier type none retrofit installation procedures/problems floor boards, varied structural type, shallow roof rafters difficulty of opening/closing sample floor boards - long  PRESENCE OF: moisture, corrosion, odor, vermin, fungus none packing O.K. friebility N/A  REPLACEMENT: insulation fiberglass batt vapor barrier none  FIELD TESTS insulation thickness 7½" flame N/A  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, galles, stops & firebreaks, ventilation, wiring, psint, installation procedures, general notes)  ARAN ARAN ARAN ARAN ARAN ARAN ARAN ARA	NAME_ADDRESS	SAMPLE NO. 29 CEILING DATE 24 August, 1977
AGE: retrofit 1 house 54 ORIENTATION N/A HEAT SYSTEM gas F.A. INSTALLER & DATE July 76  FIELD OBSERVATIONS plan location(s) bedroom		SOURCE OF LEAD NSP
PIELD OBSERVATIONS  plan location(s) bedroom	AGE: retrofit 1 house 54 ORIEN	
plan location(s) bedroom venting 2, 9" dia. roof vents per gal framing type loist & rafter condition of structure good condition of wiring N/A  ORIGINAL: insulation type none vapor barrier type none RETROPIT: insulation type blowm glass vapor barrier type none retrofit installation procedures/problems floor boards, varied structural type, shallow roof rafters  difficulty of opening/closing sample floor boards - long  FRESENCE OF: moisture, corrosion, odor, vermin, fungus none packing O.K. friability N/A  REPLACEMENT: insulation fiberglass batt vapor barrier none  FIELD TESTS insulation thickness 7½" flame N/A  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  ZX4 space with convection barrier batt labor procedures, general notes)	HEAT SYSTEM gas F.A. INSTALLER & I	DATE July '76
framing type		onting 2 0" dia mass conta and all
ORIGINAL: insulation type none vapor barrier type none RETROFIT: insulation type blown glass vapor barrier type none retrofit installation procedures/problems floor boards, varied structural type, shallow roof rafters difficulty of opening/closing sample floor boards - long  PRESENCE OF: moisture, corrosion, odor, vermin, fungus none packing O.K. friability N/A REPLACEMENT: insulation fiberglass batt vapor barrier none  FIELD TESTS Insulation thickness 7½" flame N/A  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  2x4 space with convection barrier batt	framing type <u>joist &amp; rafter</u> co	ondition of structure good
RETROFIT: insulation type blown glass vapor barrier type none retrofit installation procedures/problems floor boards, varied structural type, shallow roof rafters  difficulty of opening/closing sample floor boards - long  PRESENCE OF: moisture, corrosion, odor, vermin, fungus none packing 0.K. friability N/A  REPLACEMENT: insulation fiberglass batt vapor barrier none  FIELD TESTS insulation thickness 7½" flame N/A  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  PROD  2x4 space with convection barrier batt		vapor harrier type none
shallow roof rafters  difficulty of opening/closing sample floor boards - long  PRESENCE OF: moisture, corrosion, odor, vermin, fungus none  packing O.K. friability N/A  REPLACEMENT: insulation fiberglass batt vapor barrier none  FIELD TESTS insulation thickness 7½" flame N/A  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  PRAN  2x4 space with convection barrier  batt  Accessoros  Accessoros  Distriction barrier  Distriction b	RETROFIT: insulation type blown glass v	vapor barrier type none
PRESENCE OF: moisture, corrosion, odor, vermin, fungus none packing O.K. friability N/A REPLACEMENT: insulation fiberglass batt vapor barrier none  FIELD TESTS insulation thickness 7½" flame N/A  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  PAN  2x4 space with convection barrier batt  Acceptable  Acce		or boards, varied structural type,
none packing O.K. friability N/A REPLACEMENT: insulation fiberglass batt vapor barrier none  FIELD TESTS insulation thickness 7½" flame N/A  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  72x4 space with convection barrier  137/8 18/2 4  137/8 18/2	difficulty of opening/closing sample floor bo	pards - long
packing O.K. friability N/A REPLACEMENT: insulation fiberglass battvapor barrier none  FIELD TESTS  insulation thickness 7½" flame N/A  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  2x4 space with convection barrier  batt  aus page 18/2  49.	PRESENCE OF: moisture, corrosion, odor, vermin,	, fungus
REPLACEMENT: insulation fiberglass batt vapor barrier none  FIELD TESTS  insulation thickness 7½" flame N/A  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  PAN  2x4 space with convection barrier batt  Batt Augustus		N/A
SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  PAN  2x4 space with convection barrier  batt  Bus person  Downsonwood  Downsonw	REPLACEMENT: insulation fiberglass batt vapor b	parrier none
SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  PAN  2x4 space with convection barrier  batt  Bus person  No.  DOWNORMONDO.	FIELD TESTS	
(siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  700000000000000000000000000000000000	insulation thickness 7½" flame	N/A
insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  RAN  2x4 space with convection barrier  batt  RAN  April 18/2		
gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  PAN  2x4 space with convection barrier  batt  Russ people  Line 1872  2x4 space with convection barrier	(siding, sheathing, building paper, existing ins insulation thickness(es), vapor barrier(s), ceil	sulation, new insulation, ling materials, flooring,
PAN  2x4 space with convection barrier  batt  But part  INS  Commonwell  Aus.	gables, stops & firebreaks, ventilation, wiring,	
2x4 space with convection barrier  batt  Buts perch  INS  LATH  ROS  DOSSONOMINE  D	procedures, general notes)	
2x4 space with convection barrier  batt  Buts perch  INS  LATH  ROS  DOSSONOMINE  D		
PAN  2x4 space with convection barrier  batt  Buth Penell  NS  WHITE  AND  AND  AND  AND  AND  AND  AND  AN	13%	3-11-18/2-1
PAN  2x4 space with convection barrier  batt  Buth Penell  NS  WHITE  AND  AND  AND  AND  AND  AND  AND  AN		
2x4 space with convection barrier  batt  But peat 1  No.		
2x4 space with convection barrier  batt  But peat 1  No.		
2x4 space with convection barrier  batt  But peat 1  No.		
FLOORS PROPERTY BOTO TO THE PROPERTY BOTO THE PROPERTY BOTO TO THE PROPERTY BOTO THE PROPERTY BO	100	
BUTS ROATED TO	2x4 space	with convection barrier
AUS:		batt
AUS:	TO TO BUTS PROPER	# <del>************************************</del>
ANS.  CONSTRUCTION OF THE PARTY	NIVIA XXX LING	
SECTION 5	S Coopposition of the second o	CO CO CO TO
SECTIONS		
) and the contract of the contract of the contract of the contract of $oldsymbol{\mathbb{I}}$	GECTIONS	

	SAMPLE NO	• <u>30</u>	<u>CEILING</u>		
ADDRESS	DATE	24 A	ugust.	1977	
PHONE	SOURCE OF	LEAD	NSP		
ODVED AT		<del></del>	<del></del>		_
GENERAL  AGE: retrofit 2 vrs house 12 ORIENTAT	TON N/A	<del></del>		·	
AGE: retrofit 2 yrs house 12 ORIENTAT: HEAT SYSTEM gas F.A. INSTALLER & DATE	ION <u>N/A</u>				_
neal Sistem gas r.A. INSTALLER & DATE			March	4, 19	75
FIELD OBSERVATIONS					
	ng <u>ridge ve</u>	nts. so	ffit ve	nts	
	tion of st	ructure	excell	ent	-
condition of wiring good					_
ORIGINAL: insulation type mineral wool vapor	r barrier	type tr	eated p	aper	
RETROFIT: insulation type fiberglass blown vapor	r barrier	type	N/A		_
retrofit installation procedures/problems none					_
					_
difficulty of opening/closing sample none					-
PRESENCE OF: moisture, corrosion, odor, vermin, fur	200				-
done	ngus				
packing moderate friability N/A					-
REPLACEMENT: insulation fiberglass batt vapor barr		········		<del></del>	_
					믁
FIELD TESTS					_
insulation thickness 8 3/4" # flame_	N/A				
OVERPOURS ( 1 / 1 / )					
SKETCHES (elevation/plan/section)		1.4	•		
(siding, sheathing, building paper, existing insular					
insulation thickness(es), vapor barrier(s), ceiling gables, stops & firebreaks, ventilation, wiring, particular particula					
I GANIPS. STONS & TITPNTPAKS. VPNTIJATION. WITING. NA					
	int, insta	llation			
procedures, general notes)	int, insta	IIATION		· · · · · · · · · · · · · · · · · · ·	_
procedures, general notes)	int, insta	TIACION			1
procedures, general notes)  NOTE: Avg. depth over ceiling total 8½ - 9"	int, insta				
procedures, general notes)	int, insta	- 18"	+		
procedures, general notes)  NOTE: Avg. depth over ceiling total 8½ - 9"	int, insta		*	*	
NOTE: Avg. depth over ceiling total 85 - 9" label states original material 4"	int, insta		*	*	·
procedures, general notes)  NOTE: Avg. depth over ceiling total 8½ - 9"	int, insta		*	*	-
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"	int, insta		*	*	
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"	int, insta		*		-
NOTE: Avg. depth over celling total 8½ - 9" label states original material 4"	int, insta		*	22.12	-
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"  53/4"  mineral  wineral  mineral  mineral	int, insta		*	221/2	•
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"  53/4"  mineral  wineral  mineral  mineral	int, insta		*	2242	•
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"  534"  MiNERA  UCC.	int, insta		*	22/2	
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"  534"  MiNERA  UCC.	int, insta		*	22/2	
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"  534"  MiNERA  UCC.	int, insta		*	22/2	
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"	int, insta		*	2242	•
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"  534"  Mineral M	int, insta		*	221/2	
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"  534"  MiNERA  UCC.	int, insta		*	22/2	
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"  534"  Mineral M	int, insta		*	22/2	•
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"  534"  Mineral M	int, insta		*	22/2	
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"  534"  MiNERA  UCC.	int, insta		*	22.42	•
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"  534"  Mineral M	int, insta		*	221/2	•
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"  53/4"  mineral  wineral  mineral  mineral	int, insta		*	22/2	•
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"  534"  MiNERA  UCC.			*	22/2	
NOTE: Avg. depth over ceiling total 8½ - 9" label states original material 4"  534"  MiNERA  UCC.			*	2242	

NAME	SAMPLE NO. 31 CEILING
ADDRESS	DATE 24 August, 1977
PHONE	SOURCE OF LEAD NSP
r	
GENERAL	
AGE: retrofit 3 yrs house	20 ORIENTATION N/A
HEAT SYSTEM gas F.A.	INSTALLER & DATE Aug 20, 1974
FIELD OBSERVATIONS	011 31 651
plan location(s) bedroom	venting 4 ridge 8" dia - soffit vent
framing type joist & rafter	condition of structure excellent
condition of wiring N/A	
ORIGINAL: insulation type batt RETROFIT: insulation type blown	t/blown glass vapor barrier type kraft - tarred
retrofit installation procedures	
l rectoric inscarracton procedures	s/problems none
difficulty of opening/closing sa	ample many
difficulty of opening/closing sa	amplenone
PRESENCE OF: moisture, corrosic	on odor vermin fungue
none - attic hot	on, odor, vermin, rungus
packing good	friability N/A
	lass batt vapor barrier original left in place
KBI BAGBIBAT. INSUTACION TIBELS	rass pact vapor barrier original left in prace
FIELD TESTS	
insulation thickness 10½" total	flame N/A
SKETCHES (elevation/plan/section	n)
	per, existing insulation, new insulation,
	barrier(s), ceiling materials, flooring,
gables, stops & firebreaks, vent	tilation, wiring, paint, installation
procedures, general notes)	
4	
	BIGUN
	- waal
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3 PY WWW XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	GLASS
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24 ((((((((((((((((((((((((((((((((((((	- BAT
	_TARRED
	- KRAPT
	11000
	VAPOR BARRIER
	OPPOPER
	-1 Handon
	- HETROX
CECTION!	PERPORATED PLAN
SECTION -	MEAFT
	PAPER
	THE
Label: August 1974	
T	

NAME		32 CEILING
ADDRESS PHONE	$\underline{\hspace{0.5cm}}$ DATE SOURCE OF $\overline{\hspace{0.5cm}}$	24 August, 1977 AD VOL
GENERAL  AGE: retrofit 2 mos house 30 ORII	ENTATION N/A	
HEAT SYSTEM gas F.A. INSTALLER &	<del></del>	1, 1977
FIELD OBSERVATIONS		
	venting gable end condition of struc	s - 8 vents coming
condition of wiring good	condiction of struc	ture good
ORIGINAL: insulation type batt	vapor barrier typ	
RETROFIT: insulation type cellulose retrofit installation procedures/problems none	vapor barrier typ	eN/A
difficulty of opening/closing sample none		
PRESENCE OF: moisture, corrosion, odor, verming none	n, fungus	
packing moderate friability		
REPLACEMENT: insulation fiberglass batt vapor	barrier left ori	ginal in tact
FIELD TESTS		
insulation thickness 5" * flame	burns	
SKETCHES (elevation/plan/section)		
(siding, sheathing, building paper, existing in		
insulation thickness(es), vapor barrier(s), cer gables, stops & firebreaks, ventilation, wiring		
procedures, general notes)		
* Overall depth varies 5 - 9"		
		1-128
+ CONTROL CELLIOSE		
3 14/1//////////////////////////////////	77244	
Z. XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	Orest	
E KNOW COURSE	WKING -	-2
, Arri de	WILLIA	
L LATH 4 PLASTER		334
section .		
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		+ + +
		PLAN
		14P10
	· · ·	

NAME	SAMPLE NO. 33 CEILING
ADDRESS	DATE 25 August, 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	
	NTATION N/A
HEAT SYSTEM gas F.A. INSTALLER &	
FIELD OBSERVATIONS	
plan location(s) living room v	enting 2 gable vents, 2, 8" dia ridg
	ondition of structure excellent
condition of wiring N/A ORIGINAL: insulation type wood fiber batt	vapor barrier type <u>tarred kraft pa</u> pe
	vapor barrier type N/A
retrofit installation procedures/problems none	, , , , , , , , , , , , , , , , , , ,
difficulty of opening/closing sample none	
PRESENCE OF: moisture, corrosion, odor, vermin	, fungus
none packing good friability N/	Δ
REPLACEMENT: insulation fiberglass batt vapor	
FIELD TESTS	
insulation thickness 5½" flame	chars - self extinguishing
CVETCUES (-1	
SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing in	sulation new insulation
insulation thickness(es), vapor barrier(s), cei	
gables, stops & firebreaks, ventilation, wiring	
procedures, general notes)	
	14-2"
NXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
1 124-2"	
L- CELLVIOSE	21"
L wood BOTT	
SITEETROCK	
PAPER V.B	
PARES V.O	
SECTION	<del>                                      </del>
NOTE: Sample area shallow Average depth + 6"	
	MAN
2" batt compressed to 1 3/4"	
_ 5000 50000000000000000000000000000000	
Multi-layered batt	

ADDRESS	SAMPLE NO.	<u>34</u>	L1NG
	DATE	25 Augus	
PHONE	SOURCE OF	LEAD NSP	
GENERAL			
AGE: retrofit 9 house 11 ORIENTAT	TION N/A		
HEAT SYSTEM electric INSTALLER & DATE		Sept 1968	
FIELD OBSERVATIONS		e vents	
plan location(s) bedroom vent	ing 4 roof &	soffit	
	ition of str	icture <u>ex</u>	cellent
condition of wiring N/A ORIGINAL: insulation type fiberglass blown vapo	or berrier to	VDA DADA	
RETROFIT: insulation type cellulose vapo			
retrofit installation procedures/problems none	· · · · · · · · · · · · · · · · · · ·	, P	
difficulty of opening/closing sample none			
PDECENOR OF A CONTRACT OF THE			
PRESENCE OF: moisture, corrosion, odor, vermin, fu	ungus		
packing excellent friability N/A			<del></del>
REPLACEMENT: insulation fiberglass batt vapor bars	rier none		
FIELD TESTS			
insulation thickness see below flame N/	A		
CVETCUES (alevation/plan/acation)			
SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insula	etion new i	neulation	
insulation thickness(es), vapor barrier(s), ceiling			
gables, stops & firebreaks, ventilation, wiring, pa			
procedures, general notes)	•		
			1 1 1 1
	1	0	
* CONTRACTOR		0	
LA OO			
*			
SA CEL.		140	
3- MMM Caps			
3- MMM Caps			17"
3- Mary Gran			177
3- MMM Caps		140	
3- WIND SUPROCE			17.
3- WIND SUPROCE			17"
3- MMM MMM Capy			17"
3- WIND SUPROCE			17.
3- WILL SUTROCK			177
3- WIND SUPROCE	241		177"
SECTION SHORE	220		
3- WIND SUPROCE	241		17.
SECTION SHORE	7AU		177
SECTION SHORE	RAU		17"
SECTION SHORE	7.41		

NAME	SAMPLE NO. 35 CEILING
ADDRESS	DATE 25 August, 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	
AGE: retrofit 2 house 2	
HEAT SYSTEM gas F.A.	INSTALLER & DATE June '7
FIELD OBSERVATIONS	
plan location(s) dining	venting minimal
framing type rafter & joist	condition of structure excellent
condition of wiring N/A	
ORIGINAL: insulation type mine	ral wool vapor barrier typedisc. treated pap m fiberglass vapor barrier type N/A
retrofit installation procedures	/problems none
116611161111	1-
difficulty of opening/closing sa	mple none
DESCRIPTION OF THE PROPERTY OF	a stantage for the first of the stantage for the stantage
	n, odor, vermin, fungus
packing good	friability_N/A
	ass batt vapor barrier original left intact
REFERENCE. Insuration Tibergi	ass part vapor barrier original left intact
FIELD TESTS	
insulation thickness see below	flame N/A
	N/A
SKETCHES (elevation/plan/section	)
	er, existing insulation, new insulation,
	barrier(s), ceiling materials, flooring,
	ilation, wiring, paint, installation
procedures, general notes)	,
	14-2."
	- BOWN PGLAS
	7000,000
1114 /\ /\ /\ /\ /\ /\ /\	
+ Warrange of a control	
	- Blann wool
VILLULLI V	0-11
	272
	PAREL V.B.
	- SHOETROK
cking!	
SECTION	
NOTE: 2 labels	
19 bags 1232 sq.ft. are	a 0 redlow
	ne 1975 PAN
4" density to	maintain 90% of density

NAME	SAMPLE NO. 36 CEILING
ADDRESS PHONE	DATE <u>25 August, 1977</u> SOURCE OF LEAD NSP
FRONE	SOURCE OF LEAD NSP
GENERAL	
	IENTATION N/A
HEAT SYSTEM gas F.A. INSTALLER	& DATE July 1976
FIELD OBSERVATIONS	
plan location(s) bedroom	venting N/A
framing type <u>rafter &amp; joist</u> condition of wiring N/A	condition of structure excellent
ORIGINAL: insulation type fiberglass batt	vapor barrier type poly
RETROFIT: insulation type fiberglass	vapor barrier type N/A
retrofit installation procedures/problems non	
difficulty of opening/closing sample no	ne
PRESENCE OF: moisture, corrosion, odor, verm	in funcue
none	in, lungus
packing good friability	N/A
REPLACEMENT: insulation fiberglass batt vapo	
TIELD TESTS	
nsulation thickness see below* flam	e <u>N/A</u>
SKETCHES (elevation/plan/section)	
siding, sheathing, building paper, existing	insulation, new insulation.
insulation thickness(es), vapor barrier(s), c	
gables, stops & firebreaks, ventilation, wiri	
procedures, general notes)	
	143/4"
CY CY CY CON	
- (X)   X X X BLOWN GLASS	
\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
BLASS BLASS	
X W \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	lehi
A CONTRACTOR OF THE STATE OF TH	
The Part	
- WB	
SECTION	
SUET-	
Oner	
rec-	• • • • • • • • • • • • • • • • • • • •
test taken @ minimum depth area -	RAN
deepest insulation + 16½"	
16%" highsnot, average minimum 12"	
16½" highspot, average minimum 12"	

NAME ADDRESS PHONE	DATE		37 CEILI 25 August NSP	
GENERAL  AGE: retrofit 2 house 16  HEAT SYSTEM gas F.A. INST.	ORIENTATION N ALLER & DATE 6/75	/A		
FIELD OBSERVATIONS plan location(s) hall framing type rafter & joist	venting <b>p</b> o			
condition of wiring N/A ORIGINAL: insulation type balsam wool RETROFIT: insulation type fiberglass retrofit installation procedures/proble	vapor barr	ier type_ ier type_	treated p	paper/disco
difficulty of opening/closing sample no	ne			
PRESENCE OF: moisture, corrosion, odor none	, vermin, fungus			
packing good friab REPLACEMENT: insulation fiberglass bat		one		
FIELD TESTS insulation thickness 10" + 2½" batt	flame <u>N/A</u>			
SKETCHES (elevation/plan/section) (siding, sheathing, building paper, eximulation thickness(es), vapor barrier gables, stops & firebreaks, ventilation procedures, general notes)	(s), ceiling mater	ials, flo	oring,	
			13'4"	
	-4-	<b>h</b>		4-4-
GLASS A TOTAL	)			
RATI WWW.XX				29"
steerfack	V.B.			
SECTION				
* 3 other roof vents appear to be closed there are 6 soffit vents		PLA		
NOTE: Label reads " 15 bags 988 sq.ft,	6" reblow"	, ru	2	
		:		
		<del></del>	+	

NAME	SAMPLE		
ADDRESS	DATE	26 August, 1977	
PHONE	SOURCE	OF LEAD volunteer	
ADDED AT			_
GENERAL AGE	OD TENDATION		
AGE: retrofit 6 mos house 25	ORIENTATION no	orth April '77	
HEAT SYSTEM gas F. A. IN	STALLER & DATE	April //	
FIELD OBSERVATIONS			
plan location(s) living room	venting N/A		
framing type 2X4 stud	condition of	structure excellent	
condition of wiring N/A			
ORIGINAL: insulation type none	vapor barrie	r type none	_
RETROFIT: insulation type UF		r type none	
retrofit installation procedures/prob	olems none - 2 hole	s per cavity	_
·			
difficulty of opening/closing sample_	boards tight		
PRESENCE OF: moisture, corrosion, od	or vermin fungus		
nome	Oly verming langus		
	ability good		
REPLACEMENT: insulation UF	vapor barrier nor	ie	_
			=
FIELD TESTS			_
insulation thickness 3.5"	flame chars, no b	ourn	
CVPMOURC (-1			
SKETCHES (elevation/plan/section)	isting insulation no	inculation	
(siding, sheathing, building paper, e			
(siding, sheathing, building paper, einsulation thickness(es), vapor barri	er(s), ceiling materia	ls, flooring,	
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilation	er(s), ceiling materia	ls, flooring,	
(siding, sheathing, building paper, einsulation thickness(es), vapor barri	er(s), ceiling materia	ls, flooring,	
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilation	er(s), ceiling materia	ls, flooring,	
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilation	er(s), ceiling materia	ls, flooring, tallation	
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilation	er(s), ceiling materia	ls, flooring,	
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilation	er(s), ceiling materia	ls, flooring, tallation	
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilation	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	/4
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilation	er(s), ceiling materia	ls, flooring, tallation	e
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilatiprocedures, general notes)	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	e
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilatiprocedures, general notes)	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	E
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilatiprocedures, general notes)	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	E
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilation procedures, general notes)	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	'E
(siding, sheathing, building paper, einsulation thickness(es), vapor barringables, stops & firebreaks, ventilating procedures, general notes)	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilation procedures, general notes)  WOO SIONES  BUILES	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	·/e
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilation procedures, general notes)  WOOD SIGNED BUILE	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	'le
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilation procedures, general notes)  WOO SIONES  BUILES	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	'le
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilation procedures, general notes)  WOO SIONES  BUILES	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	'Æ
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilation procedures, general notes)  WOO SIONES  BUILES	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	'le
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilation procedures, general notes)	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	'/e
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilatiprocedures, general notes)	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	le le
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilatiprocedures, general notes)	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	"/e
(siding, sheathing, building paper, einsulation thickness(es), vapor barringables, stops & firebreaks, ventilation procedures, general notes)	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	
(siding, sheathing, building paper, einsulation thickness(es), vapor barringables, stops & firebreaks, ventilation procedures, general notes)	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
(siding, sheathing, building paper, einsulation thickness(es), vapor barringables, stops & firebreaks, ventilation procedures, general notes)	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	le l
(siding, sheathing, building paper, einsulation thickness(es), vapor barringables, stops & firebreaks, ventilation procedures, general notes)	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	<i>**</i>
(siding, sheathing, building paper, einsulation thickness(es), vapor barringables, stops & firebreaks, ventilation procedures, general notes)	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	
(siding, sheathing, building paper, einsulation thickness(es), vapor barrigables, stops & firebreaks, ventilatiprocedures, general notes)	er(s), ceiling materia on, wiring, paint, ins	ls, flooring, tallation	

NAME	SAMPLE NO. 38 CEILING
ADDRESS PHONE	DATE 26 August, 1977 SOURCE OF LEAD volunteer
FIIONE	SOURCE OF LEAD_VOIUNTEET
GENERAL	
AGE: retrofit 6 mos house 25	ORIENTATION N/A
HEAT SYSTEM gas F.A. INST	ALLER & DATE April *77
FIELD OBSERVATIONS	
plan location(s) bedroom	venting numerous soffit/5 ridge vents
framing type joist & rafter	condition of structure excellent
condition of wiring N/A	
ORIGINAL: insulation type vermiculite	
RETROFIT: insulation type fiberglass	vapor barrier type none
retrofit installation procedures/proble vents open	ms none - stops to hold soffit
	none
PRESENCE OF: moisture, corrosion, odor	, vermin, fungus
none	
	ility N/A
REPLACEMENT: insulation fiberglass ba	t Ambor parrier none
FIELD TESTS	
insulation thickness see below	flame N/A
CVETOUES (-1	
SKETCHES (elevation/plan/section) (siding, sheathing, building paper, exi	eting insulation new insulation
insulation thickness(es), vapor barrier	
gables, stops & firebreaks, ventilation	
procedures, general notes)	, , , , , , , , , , , , , , , , , , , ,
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	iculine 20°
VERM	ievline 20'
	ieulite 20'
234"	ieveine
234"	ieveine
VERM	ieveine
234"	ieveine

NAME ADDRESS PHONE	SAMPLE NO. 39 CEILING DATE 26 August, 1977 SOURCE OF LEAD NSP
GENERAL  AGE: retrofit 2 house 18 ORIEN  HEAT SYSTEM gas F.A. INSTALLER & D	TATION N/A ATE August, 1975
framing type joist & rafter co condition of wiring N/A ORIGINAL: insulation type mineral wool ' v	N/A
FIELD TESTS  insulation thickness see below flame N  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing ins insulation thickness(es), vapor barrier(s), ceil gables, stops & firebreaks, ventilation, wiring, procedures, general notes)	ulation, new insulation, ing materials, flooring,
O' PERLOWN FIRENCELES	1378"
TREATED PAPER	PIAN
2" original insulation very uneven	

ADDRESS	DATE	LE NO		4077
PHONE			26 August. AD volunteer	19//
			- vormiteer	
GENERAL				
	ENTATION	south	<del></del>	
HEAT SYSTEM gas H.W. INSTALLER &	DATE	July	1976	
FIELD OBSERVATIONS				
	venting N	/A	<del></del>	· · · · · · · · · · · · · · · · · · ·
	condition	of struct	ure good	
condition of wiring N/A				
ORIGINAL: insulation type none	vapor bar			
RETROFIT: insulation type UF retrofit installation procedures/problems none	_ vapor bar	rier type	none	
rectoric instarraction procedures/problems_none	<u>-</u>			
difficulty of opening/closing sample none				
,				
PRESENCE OF: moisture, corrosion, odor, vermi	n, fungus			
none				
packing N/A friability REPLACEMENT: insulation UF vapor	good barrier	2020		<del></del>
RELEACEPHENT. INSUIACION OF VAPOR	Darrier_	попе		
FIELD TESTS				
insulation thickness see below flame	N/A			
SKETCHES (elevation/plan/section)				
insulation thickness(es), vapor barrier(s), ce gables, stops & firebreaks, ventilation, wirin procedures, general notes)				
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<b>1</b> √⁄8	18 H 3/16	1/16_1		
				103/2
			14 1/8->	1078
			16-1/4 1/8→	10%
			<del>                                    </del>	1048
			K-1/4-1/6>	10%
				1048
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				10%
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				1078

NAME	SAMPLE NO 41 WALL
ADDRESS	DATE 26 August, 1977
PHONE	SOURCE OF LEAD volunteer
GENERAL	
AGE: retrofit 6 mos house 69 ORIENTAT	
HEAT SYSTEM gas gravity INSTALLER & DATE	February 1977
FIELD OBSERVATIONS	
plan location(s) bath venti	
6 · / F ·	tion of structure good
condition of wiring N/A	
	or barrier type none
	or barrier type none
retrofit installation procedures/problems none - s	single hole @ top of cavity
difficulty of opening/closing sample none	
PRESENCE OF: moisture, corrosion, odor, vermin, fu	ingus
packing N/A friability good	
REPLACEMENT: insulation U.F. vapor barr	ier none
PIELD TECTO	
FIELD TESTS insulation thickness 3.25" flame cha	
insulation thickness 3.25" flame cha	ar/no burn
CVETCUEC (alevation/plan/contion)	
SKETCHES (elevation/plan/section)	tion our insulation
(siding, sheathing, building paper, existing insula insulation thickness(es), vapor barrier(s), ceiling	
gables, stops & firebreaks, ventilation, wiring, pa procedures, general notes)	int, installation
procedures, general noces/	<del></del>
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LATH & PLASTER	* + + +   1
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+ BECHON	
	282
L. WIPHE BACK (INSIDE)	7/4
14/8 WIPH BACK (INSIDE)	# F4"   "-1
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SAMPLE	NOTE: ALL SHRINKAGE
PLAN SECTION	SHOWN @ OUTSIDE FACE

GENERAL  AGE: retrofit 2 mos house 12 yrs ORIENTATION N/A  HEAT SYSTEM electric heat pump INSTALLER & DATE June 12, 1974  FIELD OBSERVATIONS  plan location(s) bedroom venting 1 turkine roof vent framing type rafter & joist condition of structure good condition of wiring N/A  ORIGINAL: insulation type belsem wool 7½" vapor barrier type poly RETROFIT: insulation type mineral wool 9" vapor barrier type N/A  retrofit installation procedures/problems none  difficulty of opening/closing sample none  PRESENCE OF: moisture, corrosion, odor, vermin, fungus none  packing excellent friability N/A  REPLACEMENT: insulation fiberglass battvapor barrier original left intact  FIELD TESTS  Insulation thickness 16½" flame N/A  SKETCHES (elevation/plan/section)  (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness (es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  **COME **TAMBURE**  **THE BOTTOM OF THE SAMPLE**  **THE BOTTOM OF THE SAMPLE*  **THE BOTTOM OF THE SAMPLE*  **THE BOTT	NAMEADDRESSPHONE	SAMPLE NO. 42 CEILING DATE 26 August, 1977 SOURCE OF LEAD NSP
FIELD OBSERVATIONS  plan location(s) bedroom  plan location(s) bedroom  plan location(s) bedroom  plan location(s) bedroom  presserved to the street of the		
plan location(s) bedroom venting 1 turbine roof vent framing type rafter & joist condition of wiring N/A  ORIGINAL: insulation type balsam wool 7½ vapor barrier type poly RETROFIT: insulation type mineral wool 9" vapor barrier type N/A  retrofit installation procedures/problems none  difficulty of opening/closing sample none  PRESENCE OF: moisture, corrosion, odor, vermin, fungus none  packing excellent friability N/A  REPLACEMENT: insulation fiberglass batt vapor barrier original left intact.  FIELD TESTS  insulation thickness 16½" flame N/A  SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation, new insulation, insulation thickness(es), vapor barrier(s), ceiling materials, flooring, gables, stops & firebreaks, ventilation, wiring, paint, installation procedures, general notes)  NOTE:  SUME TRAMING  FLOCTION OF  THE BOTTOM OF		- WA
SOME FRAMING  BLOCKING A  FOLTION OF  THE BOTTOM OF	GENERAL  AGE: retrofit 2 mos house 12 yrs ORIENTA'  HEAT SYSTEM electric heat pump INSTALLER & DATE  FIELD OBSERVATIONS  plan location(s) bedroom vent  framing type rafter & joist cond  condition of wiring N/A  ORIGINAL: insulation type balsam wool 7½ vapous retrofit insulation type mineral wool 9" vapous retrofit installation procedures/problems none  difficulty of opening/closing sample none  PRESENCE OF: moisture, corrosion, odor, vermin, france  packing excellent friability N/A  REPLACEMENT: insulation fiberglass batt vapor bars  FIELD TESTS  insulation thickness 16½" flame  SKETCHES (elevation/plan/section)  (siding, sheathing, building paper, existing insulation thickness(es), vapor barrier(s), ceiling gables, stops & firebreaks, ventilation, wiring, paper)	TION N/A  E June 12, 1974  continuous soffit & ridge + ling 1 turbine roof vent lition of structure good  or barrier type poly lor barrier type N/A  fungus  rier original left intact  N/A  ation, new insulation, ag materials, flooring,
SOME FRAMING  BLOCKING A  FORTION OF  THE BOTTOM OF		
BLOCKING A FORTION OF THE BOTTOM OF	NOTE	26"
	SOME FRAMING BLOCKING A FORTION OF THE BOTTOM OF	FLAN

NAME	SAMPLE NO. 43 CE	
ADDRESS		gust 1977
PHONE	SOURCE OF LEADNS	Р
GENERAL		
	TATION N/A	
HEAT SYSTEM gas H.W. INSTALLER & DA		
FIELD OBSERVATIONS		
	nting <u>4 soffits, 2 gab</u>	les*
	ndition of structure g	ood
condition of wiring N/A		<del></del>
	apor barrier type <u>paper</u> apor barrier type N/A	
retrofit installation procedures/problems none	apor barrier type N/A	<del></del>
notice in the contraction procedures, problems in the		
difficulty of opening/closing sample none		
PRESENCE OF: moisture, corrosion, odor, vermin,	fungus	
none		·
packing good friability N/A		<del></del>
REPLACEMENT: insulation fiberglass b. vapor ba	arrier original left in	tact
FIELD TESTS		
insulation thickness see below flame	N/A	***************************************
SKETCHES (elevation/plan/section)		
(siding, sheathing, building paper, existing insu		
insulation thickness(es), vapor barrier(s), ceili		,
gables, stops & firebreaks, ventilation, wiring,	paint, installation	
procedures, general notes)		
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ADDRESS	SAMPLE NO. 44 CEILING
DUONE	DATE 29 August, 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	
AGE: retrofit 3.33 house 12-15 ORIENT	
HEAT SYSTEM gas F.A. INSTALLER & DA	ATE May 1974
FIELD OBSERVATIONS	
plan location(s) <u>bedroom</u> ver	nting 3 ridge, min soffit and ition of structure good
framing type <u>rafter &amp; joist</u> cor	ndition of structure good
condition of wiring N/A	
ORIGINAL: insulation type batt va	apor barrier type <u>foil</u>
	apor barrier type <u>N/A</u>
retrofit installation procedures/problems none	
difficulty of opening/closing sample none	
PRESENCE OF: moisture, corrosion, odor, vermin,	fungus
none	/^
packing excellent friability N	
REPLACEMENT: insulation fiberglass batt vapor ba	arrier original left intact
ETELD MECHC	
FIELD TESTS	1
insulation thickness see below flame	char / no burn
CVETCUES (-1	
SKETCHES (elevation/plan/section)	.1.64
(siding, sheathing, building paper, existing insu	
insulation thickness(es), vapor barrier(s), ceili	
gables, stops & firebreaks, ventilation, wiring, procedures, general notes)	parite, installation
procedures, general notes/	
	<b>L</b> 10"
	119"
	H19"
DODOD K-41/2" CELLUX CELE	1 9" 1
K-41/2" CELLUXOSE	1 1
K-41/2" CELLUIGHE	
K-41/2" CELLUXOSE  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
4/2" CELLUIGHE  3" PAT	143/8
	143/8
H-41/2" CELLUIGHE  WIND H-3" PAIT  FOIL FACED	143/8
	143/8
	143/8
	PLAN

NAME	SAMPLE NO. 45 CEILING
ADDRESS	DATE 29 August, 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	
	NTATION N/A
HEAT SYSTEM gas F.A. INSTALLER &	DATE 7/16/74
FIELD OBSERVATIONS	
	enting minimal
condition of wiring N/A	ondition of structure good
	vapor barrier type paper
RETROFIT: insulation type blown glass	vapor barrier type N/A
retrofit installation procedures/problems none	
*	
difficulty of opening/closing sample none	
PRESENCE OF: moisture, corrosion, odor, vermin	, fungus
none	
packing good friability N	/A
REPLACEMENT: insulation fiberglass batt vapor	barrier original left in tact
EIELD MECAC	
FIELD TESTS	
insulation thickness see below flame	N/A
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing in	sulation new insulation
insulation thickness(es), vapor barrier(s), cei	
gables, stops & firebreaks, ventilation, wiring	
procedures, general notes)	,, parit, motarration
	1-22
Braun)	
CONTROL GUASS-4	3"
WALL PRAFT-	
PERFORATE	0 (
XIVAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	
TELATED	
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Stano	PLAN
6" Reblown 7/16/74	
	and the same of th
	الشنسوس ومستند ودانس السادسين أعاد بنويت
original and the control of the cont	and the second of the second o

NAME ADDRESS PHONE	SAMPLE NO. 46 CEILING DATE 31 August, 1977 SOURCE OF LEAD NSP
GENERAL  AGE: retrofit 2 house 21 ORIENTATHEAT SYSTEM gas F.A. INSTALLER & DATE	
framing type rafter/joist condition of wiring good  ORIGINAL: insulation type wood fiber batt vapo	
packing O.K. friability N/A REPLACEMENT: insulation fiberglass batt vapor barr FIELD TESTS insulation thickness see below flame N	
SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insulation thickness(es), vapor barrier(s), ceiling gables, stops & firebreaks, ventilation, wiring, paprocedures, general notes)  Note: Label - 8" Replow	g materials, flooring,
8h Blows Plesicuss 2½ Ward Pirota	24"
TRECORD YORK V.B	

ADDRESS	SAMPLE NO. 47 CELL	ING
	DATE 31 Augus	st. 1977
PHONE	SOURCE OF LEAD NSI	<u> </u>
GENERAL		
AGE: retrofit 3 yrs house 23 yrs ORIENTA	TION N/A	
HEAT SYSTEM gas F.A. INSTALLER & DAT	<u>E</u> Marc	h 1974
FIELD OBSERVATIONS		
	ing 2 - 6½" dia roof.	numerous sof
	ition of structure ex	cellent
condition of wiring N/A		
ORIGINAL: insulation type wood fiber batt vap	or barrier type treat	<u>ed kraft -</u> d
RETROFIT: insulation type blown glass vaporetrofit installation procedures/problems none	or barrier type <u>N/A</u>	<u>,                                      </u>
rote installation procedures, problems none		-
lifficulty of opening/closing sample none		
DDPCEMOE OF		
PRESENCE OF: moisture, corrosion, odor, vermin, f	ungus	
packing O.K. friability N	/A	<del></del>
REPLACEMENT: insulation batt fiberglass vapor bar	rier original left in	place
TELD WEGOG		
TELD TESTS  nsulation thickness see below flame	N/A	
Modification Chicaness See Delow Trame	N/A	
SKETCHES (elevation/plan/section)		
siding, sheathing, building paper, existing insul		
insulation thickness(es), vapor barrier(s), ceilingables, stops & firebreaks, ventilation, wiring, p		,
procedures, general notes)	aint, installation	
rocedures, Kenerar HOLES/		
rocedures, general motes/		
rocedures, general notes/		
nocedures, general notes/	144	
	14	
	14'4	
Wes Will Glass	14/4	
West Will Brown	14'4	
BLOWN GLASS WO. PHEEL	14/4	
West Will Brown	144	17%
BLOWN GLASS WO. FIERL BOTT	144	17%
BLOWN CLASS WO. PIEUL BATI  THURTED	- V4-4	17%
BLOWN GLASS WO. FIERL BOTT	144	17%
BLOWN GLASS  WO. PHEEL  WO. PHEEL  THEFTEO  KLEEPT	14'4	17/2
BLOWN CLASS  WO. FIELD  WO. FIELD  THEATED  KREPT  V.B.	1-144	17%
BOWN 121 WO. FIELD WO. FIE	144	17/2
BLOWN GLASS  WO. PHEEL  WO. PHEEL  THEFTEO  KLUPT	14/4	17%
BLOWN CLASS  WO. FIELD  WO. FIELD  THENTED  KREPT  V.B.  EHESTOXE	14/4	17%
BOWN 121 WO. FIELD WO. FIE	14/4	17/2
BLOWNS  CLASS  WO. PIETL  THEOTEO  FLAPT  V.B.  EXHESTROCK	14/4	17%
BLOWN GLASS WO. PHORE BATT  THENTED  V.G.  8½" total thickness (2" wood fiber batt, 6½" blo	14/4	17/2
BLOWN CLASS  WO. FIELD  WO. FIELD  THENTED  KREPT  V.B.  EHESTOXE	14/4	17/2

NAME	SAMPLE NO. 48 CEILING
ADDRESS	DATE 31 August, 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	
AGE: retrofit 3 yrs house 26 yrs ORIENTA	TION N/A
HEAT SYSTEM gas F.A. INSTALLER & DAT	
8	
	soffit vents - owner to install
	ing 2 gable 8X16
	ition of structure excellent
condition of wiring N/A	
	or barrier type treated kraft or barrier type N/A
retrofit installation procedures/problems none	of barrier type N/A
Total Industrial Production, productions indice	<del></del>
difficulty of opening/closing sample none	
PRESENCE OF: moisture, corrosion, odor, vermin, f	ungus
none O V	
packing 0.K. friability N/A REPLACEMENT: insulation fiberglass batt vapor bar	rior left original intest
RELEACEMENT: INSULACION ILDELGIASS DALL VAPOR DAY	rier reit original intact
FIELD TESTS	
insulation thickness see below flame N/	'A
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing insul	
insulation thickness(es), vapor barrier(s), ceilin	
gables, stops & firebreaks, ventilation, wiring, p procedures, general notes)	aint, installation
procedures, general noces,	
NOTE: batt - 2 1/4 - 4" depth overall 9 3/4"	
Label - 6" additional	143/2-
Sample estimated 6" overall due to uneven	17/0
1 TOTAL BOWN	
Jan XXXXX GLASS	
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k VI Lord Trong wax	
3" / \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
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BARPIER	
SHETROCK	
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NAME	SAMPLE NO. 49 CEILING
ADDRESS PHONE	DATE 31 August, 1977 SOURCE OF LEAD Ina Haugen
THORE	booked of EERD IIIa naugen
GENERAL  AGE: retrofit 2 mos house 80 ORIENTA	ATION N/A
HEAT SYSTEM gas F.A. INSTALLER & DAT	· · · · · · · · · · · · · · · · · · ·
FIELD OBSERVATIONS	
	ting 4 - 8" dia roof dition of structure good
condition of wiring N/A	
ORIGINAL: insulation type mineral wool var RETROFIT: insulation type cellulose var	por barrier type poly (see below) por barrier type none
retrofit installation procedures/problems blow	n-in moderately evenly -
very deep difficulty of opening/closing sample tight according	cess
PRESENCE OF: moisture, corrosion, odor, vermin, i	tungus
packing excellent friability	N/A
REPLACEMENT: insulation fiberglass batt vapor bar	rrier <u>retrofit intact</u>
FIELD TESTS insulation thickness see below flame	D
insuration thickness see below frame	Burns
SKETCHES (elevation/plan/section) (siding, sheathing, building paper, existing insul	lation now inculation
insulation thickness(es), vapor barrier(s), ceiling	
gables, stops & firebreaks, ventilation, wiring, procedures, general notes)	paint, installation
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())))))) () () () () () () () () () () (	
VVVVV min woot	
I"-VARIED	
V Q IYYYYY V XX	
Pat V.B.	
1 \$0	PAN
EEGRAN	
* Generally appeared 1-2" mineral wool 10-12	
Little mineral wool in sample area.	" cellulose
Sample area contained 11½" cellulose.	

NAME	SAMPLE NO. 50 CEILING
ADDRESS	DATE 1 September 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	
AGE: retrofit 3 yrs house 12 yrs ORIENTA	TION N/A
HEAT SYSTEM electric baseboard INSTALLER & DAT	CE June'74
FIELD OBSERVATIONS  plan location(s) bedroom vent	-120
	ing prv. ridge, soffits lition of structure excellent
condition of wiring N/A	<u>EXCEITENC</u>
ORIGINAL: insulation type blown glass vap	oor barrier type <u>poly</u>
	oor barrier type N/A
retrofit installation procedures/problems none	
difficulty of opening/closing sample none	
PRESENCE OF: moisture, corrosion, odor, vermin, f	ungus
none frishilita w/	
packing excellent friability N/A REPLACEMENT: insulation fiberglass batt vapor bar	rier original laft intert
Tibelgiass back rapor back	original terr miacr
FIELD TESTS	·
insulation thickness 12" overall flame N	I/A
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing insul	ation, new insulation,
insulation thickness(es), vapor barrier(s), ceilin	ng materials, flooring,
gables, stops & firebreaks, ventilation, wiring, p	paint, installation
procedures, general notes)	
TOTAL LUIT	1-22
() () () (+ 5/2 PBOOM CURS	60
A A A A A A A A A A A A A A A A A A A	154
AM Haw GLASS	
1003	
CECTION	PAN
LABELS: 10/8/65	
"10" in attic - fiberglass	
June 1974 6" blow glass	
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NAME		SAMPLE NO.	51 CEILING	
ADDRESS		DATE	1 September	1977
PHONE		SOURCE OF LI	EAD NSP	
GENERAL				
	16 ORIENTAT	ION N/A		
HEAT SYSTEM gas F.A.	INSTALLER & DATE		1976	
FIELD OBSERVATIONS			outside, 2 r	idge
plan location(s) kitchen framing type rafter/joist		ng 5 small s tion of struc		
condition of wiring good	Colld 1	CION OF SCIEN	excelle	nr
ORIGINAL: insulation type miner	cal wool vapo	r barrier ty	oe treated pa	per
RETROFIT: insulation type blown	<u>n glass</u> vapo	r barrier ty	oe N/A	
retrofit installation procedures/	problems non	<u>e</u>		
difficulty of opening/closing samp	nle non	^		
difficulty of opening/closing samp	ple <u>non</u>	е		
PRESENCE OF: moisture, corrosion,	, odor, vermin, fu	ngus		
none				
packing good	friability N/A		1.5	
REPLACEMENT: insulation fiberglas	ss batt vapor barr	ier <u>original</u>	left in plac	.e
FIELD TESTS				
insulation thickness see below	flame	N/A		
SKETCHES (elevation/plan/section)			1	
(siding, sheathing, building paper insulation thickness(es), vapor ba				
gables, stops & firebreaks, ventil				
procedures, general notes)	,			•
	COLD" PLOUD	-	- 10 <del>  </del>	
I YVY A A A A A A A A A A A A A A A A A A	6/2" BLOWN PIEBECLASS			
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	-1'5" MIN . WC.	<u> </u>		1234"
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NOTE: depth under floor board	.s 5.''	<u>,</u>	la l	
	entrantia de la compresa de la compania de la comp La compania de la compania della compania della compania de la compania de la compania della compania de la compania de la compania della compania del	· · · · · · · · · · · · · · · · · · ·	<del></del>	:
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ADDRESS PHONE	SAMPLE NO. 52 CEILING  DATE 2 September, 1977  SOURCE OF LEAD NSP
GENERAL AGE: retrofit 3 house 15 yrs ORIEN	NTATION N/A
HEAT SYSTEM gas F.A. INSTALLER & D	
FIELD OBSERVATIONS	
plan location(s) <u>bedroom</u> ve framing type <u>rafter/joist</u> co condition of wiring good	enting 4 soffit, continuous ridge ondition of structure excellent
RETROFIT: insulation type blown glass v	vapor barrier type treated paper vapor barrier type N/A one
difficulty of opening/closing sample none	
PRESENCE OF: moisture, corrosion, odor, vermin, none	, fungus
packing good friability REPLACEMENT: insulation fiberglass batt vapor b	N/A barrier <u>left original in place</u>
FIELD TESTS insulation thickness 8 3/4" * flame N	/A
insulation thickness(es), vapor barrier(s), ceil gables, stops & firebreaks, ventilation, wiring,	
procedures, general notes)	H-H2-+.
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procedures, general notes)	# # # # # # # # # # # # # # # # # # #
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NOTE: * average depth over attic $8\frac{1}{2}$ - $9\frac{1}{2}$ "	# # # # # # # # # # # # # # # # # # #
CACOLLIS.	# # # # # # # # # # # # # # # # # # #

NAME ADDRESS	SAMPLE NO. 53 CEILING DATE 2 September, 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	
AGE: retrofit 3.25 house 13 yrs ORIENTA HEAT SYSTEM gas F.A. INSTALLER & DAT	
FIELD OBSERVATIONS	
plan location(s) closet vent framing type rafter/joist cond	ring 2 - 10" dia roof - numerous soffit
condition of wiring good	
	por barrier type <u>foil faced S.R.</u> por barrier type N/A
retrofit installation procedures/problems none	Total Cippe III/II
difficulty of opening/closing sample none	
PRESENCE OF: moisture, corrosion, odor, vermin, f	ungus
some water staining on a few roof rafters packing good friability	N/A
packing good friability REPLACEMENT: insulation fiberglass batt vapor bar	
FIELD TESTS	
insulation thickness see below flame	N/A
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing insul insulation thickness(es), vapor barrier(s), ceiling	
gables, stops & firebreaks, ventilation, wiring, p procedures, general notes)	
procedures, general noces/	
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NOTE: 1.1.1 Off	
NOTE: labels - 8" @ density to maintain	90% thickness 7/27/64
6" reblow 6-74	
overall attic thickness varies 10-12"	
overall attic thickness varies 10-12"	

NAME	SAMPLE · N	
ADDRESS	DATE	2 September, 1977
PHONE	SOURCE O	F LEAD NSP
GENERAL		
AGE: retrofit 3 house 25	ORIENTATION N	/A
		8/7/74
FIELD OBSERVATIONS		
plan location(s) hall		" dia ridge, 4 small so:
framing type rafter/joist	condition of s	tructure good
condition of wiring N/A		
ORIGINAL: insulation type blown wool	vapor barrier	type treated paper
RETROFIT: insulation type blown wool retrofit installation procedures/problems	vapor barrier	cype_N/A
rectoric installation procedures/problems	none	
difficulty of opening/closing sample ho	t	
diam't distribution		
PRESENCE OF: moisture, corrosion, odor, ve	ermin, fungus	
some moisture staining of structure @ roo		
packing good friability	y N/A	
REPLACEMENT: insulation fiberglass batt va	apor barrier N/	A
FIELD TESTS		
	ame N/A	
	11/11	
SKETCHES (elevation/plan/section)		
(siding, sheathing, building paper, existing	ng insulation, new	insulation,
insulation thickness(es), vapor barrier(s),		
gables, stops & firebreaks, ventilation, wi	lring, paint, inst	allation
procedures, general notes)		
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		in de la company
NOTE: label 8/7/74-6"		
		e manazari main a serre di parti di mara di ma
* attic depth average 10-12 "		

	SAMPLE NO. 55 CEILING
ADDRESS	DATE 2 September, 1977
PHONE	SOURCE OF LEAD NSP
GENERAL	
	TATION N/A
HEAT SYSTEM gas hot water INSTALLER & D	
FIELD OBSERVATIONS plan location(s) hall ve	enting 3 - 10" ridge
	ondition of structure good
condition of wiring good	
ORIGINAL: insulation type none v	vapor barrier type <u>none</u>
	vapor barrier type none
retrofit installation procedures/problems f	loorboards
difficulty of opening/closing sample floorboa	ards/hot
PRESENCE OF: moisture, corrosion, odor, vermin,	, fungus
none packing excellent friability N	1/A
REPLACEMENT: insulation fiberglass batt vapor b	
The state of the s	none none
FIELD TESTS	
insulation thickness 5 1/4" flame	char/no burn
SKETCHES (elevation/plan/section)	
(siding, sheathing, building paper, existing ins	sulation new insulation
insulation thickness(es), vapor barrier(s), ceil	
gables, stops & firebreaks, ventilation, wiring,	
procedures, general notes)	
1436-11-11/4-11-10	65/8-11-14/2-1
147 1 11/4 - 1 1 10	078-11-172
	97/2
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PLAN	
NOTE: Contract - R 24	
NOTE: Contract - R 24	